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Bulletin

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LEAD HAZARDS *

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WASHINGTON, D. C.

The point of departure for this paper is the investigation made under the direction of a committee appointed by the Surgeon General of the U. S. Public Health Service to determine the hazard from the use of lead in ethyl gasoline. The results of this investigation have been published as Public Health Bulletin number 163. Briefly, they were that there was no evidence of lead poisoning from such gasoline after exposures approximating two years. Studies are nevertheless being continued to determine whether longer exposure might not produce symptoms of plumbism. No such symptoms have been found in the year that has elapsed since the report was made.

DISTRIBUTION OF LEAD

The investigation developed several facts which are worthy of mention in connection with lead hazards in general. Perhaps the most striking of these facts was the discovery of a considerable proportion of lead in the dust of garages, even when ethyl gasoline had not been used. This amounted to as much as one-third milligram of lead to 10 cubic meters of air, or in settled dust as much as 1 per cent of the inorganic matter. Evidence of this lead was also seen in its presence, in amounts slightly greater than normal, in the feces of garage workers, and in a slight increase in the stippling of the red blood cells of such workers. In this connection it is to be noted that the methods used for the detection of lead, and the estimation of stippling, were more accurate and painstaking than had been the practice heretofore. The water supply in the cities studied was investigated and found to contain only minimal amounts of lead. Lead pipe is still in use in most of the larger cities between the mains and the domestic piping. The details of these studies are tabulated in the public health bulletin previously mentioned. The possible danger from lead ingested with water is not to be neglected. Frederick L. Hoffman [1] has called attention to the prevalence of fatal lead poisoning in the rural districts of northern New England from action of plumbisolvent waters in lead pipe, and Rigot and Émeric [2] have just reported three cases on one farm where the water contained 4 parts of lead per million.

Lead having been found in the dust of ordinary garages, it was important to know to what extent these small but distinct amounts of lead occurred in other industrial dusts. This study is still in progress. In table 1 are shown the amounts of lead that we have found thus far in the air of working places. These amounts are about the same as were found in garages during the ethyl gasoline investigation, and indicate the widespread diffusion of lead dusts.

TABLE 1.—*Lead Dust in the Air of Industrial Establishments*

Establishment	Milligrams of Lead per 10 Cubic Meters of Air
Cracker and cake factory	0.37
Underwear factory	0.35
Shirt and overall factory	0.26
Machine shop (brass)	0.24
Retail grocery	0.23
Cigar factory	0.18
Dairy	0.11
Machine shop (iron and steel)	0.10
Wooden heel factory	0.10
Tailoring and pressing shop	0.09
Mail bag factory	0.08
Ice cream plant (very damp)	0.02

EFFECT ON MUSCULAR STRENGTH

In trying to detect very slight degrees of lead poisoning, as distinct from lead absorption, it occurred to us that quantitative data might be secured of muscle strength in the group of muscles most commonly affected in lead palsy. For this purpose we devised an instrument based on the Martin [3] muscle test for clinical use in poliomyelitis. In this test the force required to overcome the muscular contraction is observed and recorded. Our apparatus was constructed in an endeavor to make uniform the leverage used around the axis of the joint whose motion was being tested, and to make uniform the angle at which the pull was exerted, so that accurate comparisons of different individuals would be possible. A description of the instrument has been published.[4] By its use, definite lead palsies were detected which were not apparent by the ordinary tests. Even these slight subclinical paralyses, however, were not frequent in men exposed to a heavy lead hazard, in many of whom other evidences of lead poisoning were present. It is possible that a combination of this instrument with an ergograph [5] would give still better results.

* Read before the Section on Preventive and Industrial Medicine and Public Health at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 18, 1927.

1. Hoffman, F. L.: Deaths from Lead Poisoning, Bull. 426, U. S. Bureau of Labor Statistics, February, 1927, pp. 7, 8, 27-33.

2. Rigot and Émeric: Plusieurs cas d'intoxication saturnine d'origin peu commune dans une famille de cultivateurs, Revue d'hyg. **49**: 259-262 (April) 1927.

3. Martin, E. G., and Lovett, R. W.: A Method of Testing Muscular Strength in Infantile Paralysis, J. A. M. A. **65**: 1512 (Oct. 30) 1915. Lovett, R. W., and Martin, E. G.: Certain Aspects of Infantile Paralysis, with a Description of a Method of Muscle Testing, ibid. **66**: 729 (March 4) 1916. Lovett, R. W.: The Treatment of Infantile Paralysis, Philadelphia, P. Blakiston's Son and Company, 1916, pp. 152-160.

4. The Use of Tetra-Ethyl Lead Gasoline in Its Relation to Public Health, Pub. Health Bull., 163, Washington, U. S. Public Health Service, 1926, p. 18.

5. Teleky and Schulz, in a paper published subsequent to our report (Ztschr. f. Hyg. u. Infektionskr. **106**: 394-420 [June 24] 1926) describe an ergograph used for a similar purpose, but their results are different.

Dr. Ludwig Edinger [6] proposed an attractive theory to explain the selective localization of the paralyses and pseudoparalyses in such diseases as tabes dorsalis and plumbism. It had long been noticed, for example, in painters, that the muscles which received the most exercise, the extensors of the right wrist which the painter uses in his back stroke, were the first to show palsy, giving the condition of wrist drop. In general, wrist drop is a characteristic symptom of lead poisoning, no matter what the trade, though other localizations of the paralysis are frequently explainable on the ground of constant overuse of certain other muscles. It is held that in general the extensor muscles of the forearm are more likely to be exhausted in almost all work—that flexion is the position of rest. Edinger's hypothesis is that there are various diseases which arise from the nonresponse, under certain circumstances, to the normal demands which function makes on the corresponding reparative process within the tissue: each person creates the symptom-complex for himself, because he works with an abnormal nervous system, or an abnormal muscular system according to the present concept. In this sense each person causes his own lead palsy for himself. Edinger admits that the course of an exhaustion disease will be different according to the nature of the underlying injury: different poisons are anchored in different sorts of cells. Normal function can do harm only on an organic basis. In connection with this hypothesis, the data secured in this study afforded quantitative comparison between the loss of power in the extensor muscles and the loss in the flexors, and between the right hand and the left. Table 2 indicates that the flexors showed as much weakness as did the extensors, and the left or less used hand as much as the right or more used hand. Clinically, of course, without this accurate method of measuring, it is easier to detect the weakness in the extensors because they are naturally the weaker muscles, but the flexors in the paralytic cases had just as much diminution of power when tested on the machine as had the extensors, and the left wrist and finger muscles lost their strength to as great a proportionate degree as did the muscles of the right forearm. These few cases, therefore, fail to support Edinger's hypothesis, though the strain on each worker at his routine occupation was not analyzed in detail, and more extensive observations are needed. There was a greater dispersion in the strength values found for the flexors than for the extensors, both as regards the finger muscles and as regards the wrist muscles, but any of the groups would serve as an index as well as any other, to judge from our small series. There was no tendency toward weakening in the whole group exposed to the severe lead hazard; the weakness was apparent only in the few cases of palsy, and only half of the patients with symptoms of lead poisoning had any paralytic signs.

Table 2.—*Strength of Different Muscle Groups in Lead Palsy of Mild Grade*

	Average Strength, in Pounds Pull Required to Overcome Contracting Muscle	
	Cases of Lead Palsy	Total Exposed Group
Wrist extensors	11 (8 to 13.5)	18 (8 to 29)
Wrist flexors	17 (12 to 19.5)	34 (12 to 52.5)
Right wrist extensors	9 (8 to 11)	18 (8 to 31)
Left wrist extensors	10 (8 to 12)	18 (8 to 26)
Finger extensors	7 (5 to 8.5)	11.5 (5 to 17)
Finger flexors	15 (9.5 to 17.5)	22.5 (9.5 to 40.5)
Right finger extensors	7 (5 to 8)	11.5 (5 to 18)
Left finger extensors	7 (4.5 to 8.5)	11.5 (4.5 to 19)

COUNT OF STIPPLED ERYTHROCYTES

The examination of blood smears for stippling was made with extreme care. We advise the use of Ehrlich stops—metal plates which fit in the optical center of the microscope oculars, having a square hole about 6 mm. across, so that that part of the field which is in good focus is the only part seen, and so that as the stained blood smear is moved across by the mechanical stage, every part is under equal observation. This obviates many of the disadvantages of the circular field. We used a toluidine blue, borax-methylene blue stain with a little eosin to stain faintly the contour of the red blood cells, so that by accurate focusing particles lying on or beneath the cells could be distinguished from true stippling. The modified stain was devised by Dr. W. T. Harrison. We counted only fields in which: (1) there was no confusing dirt, débris, or precipitated stain; (2) the red cells were round, fairly uniform in shape and size, even in color or having slightly more color in the half toward the rim than in the center half of the cells, fairly close together but not overlapping in more than half the cells; (3) the white cells for the most part were well preserved, round, with a clearly defined edge, and (4) the leukocytic neuclei were stained a good, fairly deep blue—not pale blue and not a reddish blue—the predominant color of the slide, as in the cytoplasm of the leukocytes and the platelets, being blue and not red or pink.

True stippling shows the following characteristics:

1. The spots are strictly confined to the red cell, no similar spots being found outside the cell.
2. The spots are either evenly distributed throughout the cell, or are thicker in the rim half of the cell without being specially grouped in any part of the rim.
3. The spots are in sharp focus at exactly the same level as the edge of the red cell.
4. The spots are bluish, not brownish.
5. When the microscope objective is slightly raised by means of the fine adjustment so as to put the spots just out of focus, true stippling disappears, while other particles often appear to be clear in the center and dark toward the outside of each spot, that is, become obviously refractile.
6. The spots are fairly uniform in size in any single cell, though varying greatly in different specimens.

Accurate count of the number of fields examined can be made by noting the vernier readings of the mechanical stage at each change in direction of movement; this multiplied by the average number of red cells per field gives the total number of red cells examined. Though reticulation and polychromatophilia are doubtless processes in the same direction as stippling, we did not use them because the observation of reticulation and the enumeration by means of pipets and counting chambers are not processes that lend themselves to accurate checking in the laboratory at any time other than immediately after the blood is drawn. In our hands, stippling showed a remarkable parallelism with apparent lead absorption, and when carefully car-

6. Edinger, L.: Eine neue Theorie über die Ursachen einigen Nervenkrankheiten, insbesondere der Neuritis und der Tabes, in Volkmann: Sammling klinische Vortrage, 1894, number 106; Die Aufbranchkrankheiten der Nervensystems, Deutsche med. Wchnschr. **30**, numbers 45, 49, 52, 1904; **31**, numbers 1, 2, 1905; Der Anteil der Funktion an der Entstehung von Nervenkrankheiten, Wiesbaden, J. F. Bergmann, 1908.

ried out was our most important single clinical check on this phase of the studies in lead. It is probable that the presence of definitely stippled cells in considerable number without other marked changes in the blood picture is the one criterion of this sort which means lead absorption with a certainty of the same order of magnitude as applies to the Wassermann reaction in syphilis.

Yet even with all these precautions we have no evidence that stippling in itself shows lead poisoning or such a high degree of susceptibility to lead that the subject should be excluded from work. On the other hand, careful examination of a group of workers will show, by the presence of marked stippling in a considerable proportion of the group, that measures should be taken for the amelioration of the lead hazard. A criterion of danger may be set at more than 20 stippled cells per hundred thousand. Indications of need for improvement should, after all, be one of the chief values at present of the routine medical examination of workers in lead. If the hazard is great, it is by no means always possible to detect a susceptible worker before harm is done, but the harm can be kept at a minimum by the routine medical and laboratory examination and by the improvement of working places where the hazard is shown by such examination to be severe.

The problem of prevention is often largely an engineering one, with help in direction and stimulation from physiologists and medical men. As has been emphasized by the Harvard investigators,[7] the respiratory tract is the most important portal of entry in lead poisoning, and respirators are not effective in actual practice, which means that dust must be kept down to prevent plumbism. A high rate of turnover in labor has often been a solution, but a somewhat unsatisfactory one. In spite of the general diffusion of lead dust, in most industries and in most places the intensity of the hazard of lead is being gradually lessened, but continual activity and study are necessary to accelerate this progress, to clear up the many serious exposures remaining, and to prevent lapses and new dangers in respect to this most important industrial poison.

16 Seventh Street S.W.

ABSTRACT OF DISCUSSION

DR. ALBERT J. CHESLEY, St. Paul: As the representative of the state health officers I had the privilege of serving on Surgeon General Cumming's committee which studied the tetraethyl lead hazard. No one here can appreciate more than I do the splendid work done by the U. S. Public Health Service on the lead hazard of ethyl gasoline. The ingenuity displayed in devising new methods and modifying old ones for practical tests, such as the muscle testing device, and in working out laboratory methods, is evidence of the quality and ability of the workers of the U. S. Public Health Service. State health officers realize their obligations to the public and know that very few states have facilities for the proper study of industrial hygiene problems. Not only lead hazards but all sorts of other hazards in industries occur that may have new phases which are not covered by the present textbooks, and are not understood because they have not been differentiated by intensive field and laboratory investigations. The Conference of State and Provincial Health Authorities adopted a resolution as a result of statements made in the reports of the Committee on Industrial Hygiene and the Committee on Conservation of Vision, and I suggest that the Committee on Resolutions of this section consider the advisability of using that resolution as a resolution of this section because it has behind it the state and provincial health authorities of North America. It is worded as follows:

WHEREAS, The reports of conference committees have shown that health hazards are arising constantly in industries which require intensive field investigation and special laboratory studies before proper measures can be devised for the protection of the workers in the industries, and often of the general public as well, and whereas few states are provided with the trained personnel and special laboratory facilities necessary for the study of such health hazards, therefore, be it

Resolved, That this conference respectfully petition the Congress of the United States to make possible an increase in the personnel and resources of the United States Public Health Service, in order that the service may extend its activities in the field of industrial hygiene.

[NOTE.—Dr. Emerson, New York, moved the adoption of the resolution. The motion was seconded and carried.]

DR. HAVEN EMERSON, New York: Dr. Leake brings out with a perfection of technical approach that has not been equaled elsewhere the prevalence of lead in a community. Dr. Carl Vogel, at St. Luke's Hospital in New York, found that between 3 and 4 per cent of all patients admitted had significant amounts of lead in the stools. Dr. Kehoe of Dayton, Ohio, reported that there were cities where lead was found in the stools of all persons. This was doubted in New York. Dr. Frederick B. Flynn, with the students of the fourth year class at the College of Physicians and Surgeons, studied the stools of 500 persons in various occupations, young and old, men and women, and found that significant amounts of lead could be demonstrated in the stools of between 3 and 4 per cent of the general population of New York City. That led to a tentative conclusion that so far as our community is concerned, unless an industry shows a higher incidence than 4 per cent of the employees with lead in the stools, we should not assume that there is a specific industrial hazard.

7. Aub, J. C.; Fairhall, L. T.; Minot, A. S., and Reznikoff, P.: Lead Poisoning, Medicine 4: 52, 208 (Feb.-May) 1925. Hamilton, Alice: Industrial Poisons in the United States, New York, Macmillan Company, 1925, p. 538.

THE STUDY OF LEAD POISONING IN AN ENAMELING PLANT *

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In a study of the health problems of Nashville during the past year, a survey was made of the industries of the community employing a hundred or more men, from the standpoint of the medical service and hygienic measures provided for the care and protection of the health of employees. As many as thirty-five industrial and commercial establishments were investigated. Hazardous processes involving the use of dangerous substances were noted in four of these places; in three, the protection by enclosure and exhaust ventilation appeared to be adequate, while in one of the places examined the method of handling the process was not satisfactory.

After the study had been made, a workman from the factory which was pronounced as having a possible industrial hazard reported, October 23, to a local hospital for examination. The hospital record of the case revealed that the patient's condition had been diagnosed as peptic ulcer. The observations of the clinician in the hospital were also suggestive of cholecystitis, and consideration was given to the advisability of performing an operation. However, on further examination of the patient, particularly of the blood, a diagnosis of lead poisoning was made. The patient was given treatment and advised not to return to his usual place of

* Read before the Section on Preventive and Industrial Medicine and Public Health at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 18, 1927.

occupation. This advice was followed, but after several days the foreman of the industry offered the person an increase in salary which caused him to return to work.

A student in the fourth year class of Vanderbilt University School of Medicine, who had assisted in the examination of this patient, became interested in the source of the lead poisoning from the point of view of an occupational hazard, and reported the case to the head of the department of preventive medicine. He was then requested to obtain information concerning the patient's place of business, and whether others were suffering from similar symptoms. This resulted in obtaining blood from nine other persons working in the same factory and of this number six, on microscopic examination, showed basophilic granulation of the red blood cells. This led to a further investigation of the industry, and it was found that forty-five men were employed in an enameling factory, all of them working under essentially the same conditions. The process consisted in the enameling of stoves and parlor ranges.

It was evident that neither the management of the industry nor the employees were conscious of the danger that prevailed relative to possible lead absorption. At a conference with the state commissioner of labor, the factory inspector and the state health commissioner, it was deemed advisable to institute a careful investigation of the conditions that existed. With the approval of the management, the employes were interviewed and advised concerning the danger under which they were working. Arrangements were made for them to come voluntarily to the outpatient department of the Vanderbilt University School of Medicine for a careful medical examination. Thirty-nine of the forty-five employees reported at the time specified for this examination.

In making this clinical study, the accompanying record form was used; and it is given here for whatever suggestive value it may possess in a similar undertaking.

RECORD FORM

Name Sex Age Length of Service
Type of work Length of time he has been engaged at this work
Statement as to general health:
(*a*) before employment by present company
(*b*) since employment by present company
Days lost from work during 1926:
Nature of illness in each instance:
Has patient known that there was a lead hazard in present occupation?
Does patient always wash hands with soap before eating?
How many baths per week does patient take?
Does patient smoke while at work? Cigarettes; pipe; cigars.
The presence or absence of any of the following symptoms:
A. 1. Pallor. 2. Weakness. 3. Giddiness. 4. Palpitation. 5. Dyspnea. Remarks:
B. 1. Colic. 2. Constipation. 3. Diarrhea. 4. Alternate diarrhea and constipation. 5. Transient headaches. Remarks:
C. Presence or absence of pain about any of the joints, especially: 1. Knee joints. 2. Elbow joints. 3. Shoulder joints. Remarks:
D. 1. Persistent headaches. 2. Tremulousness. 3. Paresthesia. 4. Motor weakness: fingers; wrists; shoulders; ankles; feet. 5. Mental symptoms, as hallucinations. Remarks:
E. Maximum weight Present weight
Loss or gain in weight during past 12 months

PHYSICAL EXAMINATION

Height. Weight. Pulse rate. Skin. Lymph gland enlargements: (*a*) local; (*b*) general. Mucous membranes. Teeth. Gums: (*a*) lead line; (*b*) pyorrhea. Tonsils. Neck. Lungs. Heart. Blood pressure. Peripheral vessels. Abdomen. Genitalia. Rectal examination. Joints. Cranial nerves. Motor functions. Sensory functions. Reflexes. Abnormalities not noted above.

LABORATORY EXAMINATIONS

Urine. Hemoglobin. Red blood count. White blood count. Blood smear. Wassermann reaction. Special examinations or tests. Summary. Diagnosis:

It is seen that the history was taken to determine the presence or absence of any of the usual groups of symptoms encountered in lead poisoning, such as

(*a*) symptoms of anemia;
(*b*) gastro-intestinal symptoms;
(*c*) joint symptoms, and
(*d*) symptoms referable to the nervous system.

No attempt was made to take a complete medical history, but a thorough physical examination was made and reported in each instance.

The routine laboratory work included an examination of a single specimen of urine (sugar, albumin and sediment); a red blood count; a hemoglobin determination (Sahli); a white blood count and an examination of a stained (Wright) blood film, and a blood Wasserman examination.

In cases in which they seemed indicated, more extensive studies of the patients were made. The elaborate and time consuming examination for lead in the urine and feces was not made. It had been previously established that a lead hazard existed in the factory in which the group was employed.

The work as outlined was carried out by two teams from the medical staff of the Vanderbilt Hospital. Each team consisted of three physicians: Drs. C. S. Burwell, J. S. Lawrence and DeWitt Neighbors; and Drs. C. P. Wilson, Edgar McPeak and H. J. Morgan. A group of medical students from the fourth year class of the Vanderbilt University School of Medicine assisted with the laboratory examinations. On the completion of the examination in each case, the data obtained were analyzed and correlated by one of the examiners.

The accompanying table represents an analysis of the observations in the thirty-nine cases.

The point of especial interest in this table is, of course, the high incidence of lead poisoning in the group. A definite diagnosis of plumbism was made in fifteen cases (39 per cent). A diagnosis of "probable lead poisoning" was made in eleven cases (28 per cent). Only thirteen of the thirty-nine men examined did not show any evidence of the disease.

The average age of the workmen in the enameling plant who were diagnosed as having unquestionable lead poisoning was 27.6 years. The oldest was 45 and the youngest 18 years of age. All of them were white with the exception of patient 10, who was a negro. One was a "baker"; four were "enamel burners"; five were "sprayers"; one was an inspector; one a furnace man; one a foreman; one a "grainer"; and one a "mixer." The minimum time of employment of any one of the fifteen was two and a half months, and the maximum time was about four years. Thirteen of the fifteen (86.7 per cent) gave a history of both colic and constipation. Eight of the fifteen (53.3 per cent) gave a history of motor disturbance. Eleven of the fif-

teen (73.3 per cent) showed secondary anemia. Thirteen of the fifteen with lead poisoning (86.7 per cent) were from 15 to 45 pounds (7 to 20 Kg.) underweight. In five of the fifteen (33.3 per cent), a lead line was observed. One (6.6 per cent) showed weakness of the extensors of the fingers, and three (20 per cent) showed weakness of the extensors of the wrists and fingers. In one (6.6 per cent) there was a diminished knee jerk. Three (20 per cent) showed diffuse arteriosclerosis. One (6.6 per cent) had cardiac dilatation and hypertrophy. One (6.6 per cent) had sclerosis of the retinal arteries. Two (13.3 per cent) showed anisocoria.

In the examination of the blood, the maximum red blood cell count was 5,100,000 and the minimum was 3,080,000. The average count for the fifteen men was 3,948,266, and for thirteen of the fifteen with a count between three and four million, the average was 3,772,615. The lowest hemoglobin estimation was 55 per cent and the highest was 90, the average being 71.35 per cent. All of the fifteen men showed stippling of the red blood cells. The maximum white blood cell count was 11,400 and the minimum 6,100, the average being 8,353.

In twelve of the fifteen men the urine was normal, while three showed some pus cells, and one albumin and mucous shreds. The Wassermann reaction proved negative in all fifteen individuals.

The second point of interest brought out by the examination of this group is that there was not a single individual who could be given an absolutely "clean bill of health." Of the thirty-nine men examined, fifteen had pyorrhea; eleven, dental caries; five, chronic tonsillitis; one, chronic prostatitis; one, asthma; one posterior urethritis; one, hepatomegalia [1]; one, dilated external inguinal rings; one, emphysema; seven, arteriosclerosis; three, organic heart disease; one, pyuria; one, epididymitis; two, relaxed inguinal rings; one, chronic urethritis; one, prostatic hypertrophy; one, subacute prostatitis; one, right external strabismus; one, chronic arthritis; two, right inguinal hernia; one, hypertension, and one, obesity. The majority of these physical defects were encountered in individuals who considered themselves in good health, with the exception of those suffering from symptoms of lead poisoning. It is obvious that many of these conditions could either be cured or greatly improved by the institution of the proper surgical or medical procedure, with profit both to the individual employee and to the employer.

These data emphasize the great need of a periodic physical examination of members of the industrial population of this country. It would seem that the practice of annual examinations of the industrial class would result in greater benefit than would accrue to wealthier groups of individuals. The present study of thirty-nine employees in a single industry affords a striking example of the opportunity that exists for the improvement of health and efficiency in groups of workers. This would not only cause the removal of industrial hazards but also result in the correction of definite "health hazards."

The place of occupation of the thirty-nine employees was in a building not primarily constructed for this industry. Information obtained during the physical examination showed that the men were uninformed concerning the danger of the occupation. Twenty-six of them stated that they smoked while engaged in work. The majority of them indicated that they were careless about washing their hands before eating. There was no special place provided for the lunch hour, and many of them ate in the room where they had been working, thus exposing their food to dust. The room was inadequately ventilated, and on investigation it was found that the dust which was removed by the exhaust system was caused to return to the place of work, owing to air currents which were created in a closed alley. Thus, a vicious circle was established. The lighting facilities also were insufficient.

The six booths used for spraying were small and were provided with an ineffective exhaust system. The enamel mixture used was thick, and contained more than the usual percentage of lead and some cadmium. It was a mixture essentially of ground glass and lead which formed a soluble oxide. This mixture was sprayed on pieces of iron stoves in the booths, spray guns with 80 pounds of pressure being used. When the mixture was discharged on the iron, there was a rebound of dust particles within the booth and outside. The men who were engaged in spraying breathed freely the lead laden dust. Moreover, enamel powder, consisting as it does of ground glass, is not light, and an upward draft carries off only a small part, while side drafts simply blow it about. The walls, ceiling and windows were covered with dust, and it was obvious that the air of the room was more or less permeated with dust particles. The room was improperly cleaned between working hours. The floor was not flushed but was cleaned by dry sweeping from time to time. The men were careless in handling the enamel mixture, getting it freely on their hands and faces. The washroom was small, dark and poorly ventilated, with only one basin and an improper provision of lockers. Only two shower baths were in use. The work clothes were kept in the same compartment of the locker as the street clothes. None of the men were given a physical examination on being employed, and provision was not made for medical supervision of the employees. In a word, the place of occupation was dusty, poorly ventilated and improperly lighted and, generally speaking, carelessness prevailed on the part both of the employee and of the employer.

It is well known that persons who work with lead in any form, unless care is taken, are liable to lead poisoning. During the last few years, five enameling factories have been established in Tennessee, which is evidence that this phase of industry is growing. The studies which have been made of lead industries by the United States Public Health Service show that the dust and fumes of lead cause more sickness among workers than is caused by any other metal. More than half of all the serious cases of metal poisoning are due to lead. Nine tenths of all lead poisoning can be prevented by keeping the dust and fumes from entering the mouth and nose of the worker.

The portals through which lead gains admission to the body are, in the order of their importance, the respiratory tract, the gastro-intestinal tract and the skin.[2] It enters through the mouth with food or it may also be swallowed with saliva if tobacco is used in any form or if fingers soiled with enamel mixture are put into the mouth. The chief avenue through which

1. The patient refused to enter the hospital for further study and therefore the etiology of the enlarged liver was not determined. The patient fell into the group of "lead poisoning" cases and showed a frank secondary anemia.

2. Aub, J. C.; Fairhall, L. T.; Minot, A. S., and Reznikoff, P.: Lead Poisoning, Medicine Monograph, 7, chapter V, p. 43.

lead poisoning occurred in this group of individuals was by the inhalation of dust through the nose and mouth. The measures advised for the prevention of lead poisoning in this factory were based on: (1) personal hygiene; (2) correction of unhygienic conditions, and (3) adequate medical supervision.

THE PRACTICE OF PERSONAL HYGIENE

Experience has shown that the presence of food in the stomach aids in preventing lead absorption, and therefore the men were advised to eat a hearty meal before going to work. The need for the drinking of milk was emphasized not only at mealtime but even during working hours. The employees were advised not to eat in the workroom, and to refrain from drinking from uncovered vessels.

The management was required to get individual lockers for the workmen with separate compartments for the street clothes and those worn during work hours. These lockers were placed in a separate room, and the men were advised not to wear the clothes home that were worn in the workroom. The employees were urged to wash their hands well with a soap and a brush, and the face with hot water and soap before eating. They were also advised relative to mouth hygiene. Individual soap and towels were provided. The workmen were informed of the necessity of taking shower baths before putting on street clothes or leaving the workroom. Emphasis was placed on keeping the body clean by bathing in warm water not less than twice each week, and on drinking water freely. They were also cautioned against poor

*Results of Observations of Thirty-Nine Workmen**

Case	Age, Yr.	Ht., In.	Wt., Lb.	Occupation	History of: Colic	History of: Motor Disturbance	History of: Anemia	Positive Observations in Physical Examination	Red Blood Cell Count	Hemoglobin (Sahli) %	Stippling of Red Blood Cells	White Blood Cell Count	Urine	Diagnosis
1	31	75	173	Enamel baker (6 mo.)	Present	Absent	Absent	Pyorrhea alveolaris; undernutrition	4,340,000	82	+	8,400	Normal	Lead poisoning; pyorrhea alveolaris; undernutrition
2	25	68	123	Enamel burner (4 yr.)	Present	Present	Present	Pyorrhea and dental caries; "suggestive" lead line; undernutrition	3,920,000	65	+	6,800	Normal	Lead poisoning; pyorrhea alveolaris; dental caries; undernutrition
3	30	71	147	Enamel burner (1¼ yr.)	Present	Present	Present	"Suggestive" lead line; undernutrition	3,284,000	58	Absent	6,200	Normal	Lead poisoning; undernutrition
4	38	71	147	Enamel sprayer (3 mo.)	Present	Present	Present	Dental caries; undernutrition	3,600,000	67	++	6,100	Normal	Lead poisoning; dental caries; undernutrition
5	18	71	143	Enamel sprayer (1 yr.)	Present	Absent	Absent	Undernutrition	3,780,000	78	+	8,000	Normal	Lead poisoning; undernutrition
6	26	74	164	Enamel burner (2 yr.)	Present (appendix removed in one attack)	Present	Present	"Suggestive" lead line; pyorrhea and dental caries; diffusely thickened blood vessels; weakness of extensor muscles of wrists and fingers; anisocoria; chronic tonsillitis; undernutrition	3,820,000	72	+	10,200	Normal	Lead poisoning; pyorrhea and dental caries; chronic tonsillitis; undernutrition
7	26	67	132	Enamel burner (5 mo.)	Present	Absent	Present	Chronic tonsillitis; undernutrition; diminished knee jerks; prostatic tenderness	5,080,000	90	+	6,600	Few pus cells	Lead poisoning; chronic tonsillitis; chronic prostatitis;? undernutrition
8	22	66	153	Enamel sprayer (2½ mo.)	Absent	Absent	Absent	"Suggestive" lead line; pyorrhea alveolaris; sclerosis of retinal arteries	3,900,000	..	++	6,500	Normal	Lead poisoning; pyorrhea and dental caries; bronchial asthma (history)
9	25	71	134	Inspector (8 mo.)	Present	Present	Present	Pyorrhea alveolaris; undernutrition	3,080,000	74	+	10,800	Normal	Lead poisoning; pyorrhea alveolaris; undernutrition
10	33	75	166	Furnaceman (5 mo.)	Absent	Absent	Absent	Lead line; pyorrhea alveolaris	4,700,000	85	+	8,900	Normal	Lead poisoning; pyorrhea alevolaris
11	22	71	138	Enamel sprayer (9 mo.)	Present	Present	Present	Weakness in extensors of fingers; undernutrition	3,920,000	70	+	9,800	Slight albumin urea; mucous shreds; pus cells	Lead poisoning; undernutrition; posterior urethritis?
12	26	69	137	Enamel sprayer (4 mo.)	Present	Absent	Present	Pyorrhea alveolaris; diffuse thickening of blood vessels; undernutrition	3,700,000	65	+	8,600	Normal	Lead poisoning; pyorrhea alveolaris undernutrition
13	29	69	165	Foreman (1½ yr.)	Present	Present	Present	Lead line; weakness of extensors of wrists and fingers; pyorrhea alveolaris; enlarged liver; dilated external inguinal rings	3,900,000	64	+++	7,600	Normal	Lead poisoning; pyorrhea alveolaris; hepatomegalia; dilated external inguinal rings
14	18	69	147	Enamel grainer	Present	Absent	Present	Undernutrition	5,100,000	74	+	11,400	Normal	Lead poisoning; undernutrition
15	45	68	151	Enamel mixer	Present	Present	Present	Extensor weakness of diffuse arteriosclerosis, cardiac dilatation and hypertrophy; anisocoria	3,100,000	55	++++	9,400	Pus cells	Lead poisoning; emphysema; arteriosclerosis; cardiac dilatation and hypertrophy; pyuria
16	27	68	155	Dipper (4 yr.)	Absent	Absent	Absent	Tenderness of left epididymis	4,440,000	68	+	11,000	Pyuria	Lead poisoning;? epididymis; secondary anemia
17	26	81	167	Inspector (11 mo.)	Absent	Absent	Absent	Undernutrition; carious teeth	3,462,000	71	+	6,800	Normal	Lead poisoning;? undernutrition; secondary anemia
18	26	65	129	Grainer (5 mo.)	Present	Absent	Absent	Large tonsils; slight cardiac hypertrophy; anisocoria; "suggestive" extensor weakness of fingers	4,400,000	82	Absent	7,100	Normal	Lead poisoning;? cardiac hypertrophy; secondary anemia
19	19	68	152	Grainer (18 mo.)	Absent	Absent	Absent	Slight weakness of extensors of wrist; large scarred tonsils; dilated external inguinal rings	4,290,000	72	Absent	11,000	Normal	Lead poisoning;? chronic tonsillitis; secondary anemia; relaxed inguinal rings

Results of Observations of Thirty-Nine Workmen—Continued*

Case	Age, Yr.	Ht., In.	Wt., Lb.	Occupation	History of: Colic	History of: Motor Disturbance	History of: Anemia	Positive Observations in Physical Examination	Red Blood Cell Count	Hemoglobin (Sahli) %	Stippling of Red Blood Cells	White Blood Cell Count	Urine	Diagnosis
20	22	65	148	Grainer (3 mo.)	Absent	Absent	Absent	Pyorrhea alveolaris and dental caries; blood pressure 140/90	4,880,000	80	Absent	7,800	Normal	Lead poisoning;? pyorrhea alveolaris and dental caries; secondary anemia
21	17	69	153	Grainer (9 mo.)	Present	Present	Absent	Dental caries; urethritis	4,110,000	75	Absent	8,300	Normal	Lead poisoning;? secondary anemia; chronic arthritis
22	49	66	112	Cleaner (9 mo.)	Present	Absent	Present	Undernutrition; weakness of extensors of wrists; arteriosclerosis; prostatic hypertrophy	3,900,000	81	Absent	8,800	Trace of sugar; few pus cells	Lead poisoning;? arteriosclerosis; secondary anemia; undernutrition; prostatic hypertrophy
23	29	70	140	Sprayer (1 yr.)	Present	Absent	Absent	Dental caries; undernutrition; thickened peripheral vessels; blood pressure 144/84; soft, tender prostate	4,482,000	82	Absent	11,400 occasional myelocyte	Normal	Lead poisoning;? subacute prostatitis; undernutrition
24	21	67	140	Sprayer (1 mo.)	Absent	Absent	Absent	"Suggestive" lead line; pyorrhea; dental caries; right external strabismus	4,820,000	91	Absent	7,600	Normal	Lead poisoning;? right external strabismus (congenital?); pyorrhea and dental caries
25	21	68	138	Grainer (18 mo.)	Present?	Absent	Absent	"Suggestive" weakness of flexors of hands and feet	4,720,000	82	Absent	6,900	Normal	Lead poisoning;? undernutrition
26	30	69	156	Sand blaster (1 mo.)	Absent	Absent	Absent	"Suggestive" lead line; pyorrhea and dental caries	4,118,000	83	Absent	9,000	Normal	Lead poisoning;? secondary anemia; dental caries and pyorrhea
27	22	71	152	Enameler (3 yr.)	Absent	Absent	Absent	Undernutrition	5,000,000	96	Absent	9,200	Normal	Undernutrition
28	40	66	141	Sand blaster (1½ yr.)	Absent?	Absent	Absent	Pyorrhea alveolaris; dental caries; diffuse arteriosclerosis	4,200,000	78	Absent	7,400	Normal	Pyorrhea alveolaris; dental caries; arteriosclerosis; secondary anemia
29	27	71	142	Burner (8 mo.)	Absent	Absent	Absent	Dental caries; diffuse arteriosclerosis; dilated inguinal rings; undernutrition	3,600,000	80	Absent	6,000	Normal	Dental caries; diffuse arteriosclerosis; relaxed external inguinal rings; undernutrition
30	21	71	140	Grainer (6 mo.)	Absent	Absent	Absent	Undernutrition; enlarged posterior cervical glands (right); remnants of tonsils (tonsillectomy)	5,500,000	92	Absent	11,400	Normal	Undernutrition
31	29	68	128	Sprayer (3 mo.)	Absent	Present?	Absent	Tenderness about right elbow and shoulder joints; history suggesting arthritis	5,040,000	80	Absent	6,800	Normal	Mild chronic arthritis;? undernutrition
32	19	67	160	Burner (7 mo.)	Absent	Absent	Absent	Right inguinal hernia	4,460,000	90	Absent	8,500	Normal	Right inguinal hernia
33	21	70	141	Grainer (2 yr.)	Present?	Absent	Absent	Chronic tonsillitis; diffusely thickened blood vessels; undernutrition	4,640,000	82	Absent	6,800	Normal	Chronic tonsillitis; early arteriosclerosis; undernutrition; secondary anemia
34	36	73	182	Foreman, (16 mo.)	Absent	Absent	Absent	Pyorrhea; dental caries; diffuse arteriosclerosis	3,520,000	65	Absent	6,500	Normal	Pyorrhea alveolaris; dental caries; arteriosclerosis; secondary anemia
35	20	67	142	Grainer (8 mo.)	Present?	Absent	Absent	Chronic tonsillitis; cardiac hypertrophy with organic mitral systolic murmur	4,520,000	95	Absent	10,000	Normal	Chronic tonsillitis; chronic endocarditis of mitral valve
36	32	68	156	Grainer (4 mo.)	Absent	Absent	Absent	Systolic mitral murmur without enlargement, etc.; faint macular rash	3,680,000	80	Absent	7,600	Normal	Secondary anemia; syphilis? study incomplete
37	32	64	117	Sprayer (1 yr.)	Absent	Absent	Absent	Right inguinal hernia; pyorrhea alveolaris	4,800,000	76	Absent	7,200	Normal	Right inguinal hernia; pyorrhea alveolaris; secondary anemia; undernutrition
38	45	69	220	Sand blast (1 yr.)	Absent	Absent	Absent	Dental caries; arteriosclerosis; hypertension (175/120); obesity	4,660,000	83	Absent	9,100	Normal	Obesity; arteriosclerosis; hypertension; dental caries
39	43	67	155	Sand blast (16 mo.)	Absent	Absent	Absent	Pyorrhea alveolaris	3,920,000	72	Absent	6,600	Normal	Pyorrhea alveolaris

* The Wassermann reaction was negative in all cases. The Kahn reaction was doubtful in case 36.

elimination and the dangers of constipation. The management of the factory was impressed with the necessity of moist sweeping and the dusting of floors and work benches. The danger of chewing tobacco while at work was stressed. As the severity of lead poisoning is increased by the use of alcohol in any form, this practice was discouraged.

CORRECTION OF UNHYGIENIC CONDITIONS IN FACTORY

The most important step taken by the management was to improve the exhaust system and provide a new type of booth. A new exhaust system was installed with its efficiency increased from 2,200 cubic feet of air removed per minute to about 7,300 cubic feet. The ventilation was generally improved, and physical defects in the building were corrected so as to prevent currents of air from causing a return of the dust into the work room. The floors and woodwork were thoroughly cleaned, and greater cleanliness was observed in keeping the place of occupation in a sanitary condition. The washroom was enlarged, and lighting and ventilating facilities were improved. The standard number of wash basins was provided. The number of shower baths was increased, and individual lockers were obtained for the use of the workmen. The foreman was instructed relative to the fundamental importance of the utmost care being used by the

employees while at work, particularly those using spray guns. Masks were not recommended because of a lack of security and convenience in their use. Unfortunately, the enamel mixture is unusually thick and heavy, so that, in spite of the improvement of the exhaust system, the men using spray guns are still exposed to a volume of dust which is not conducive to their welfare, but by the observance of the precautions indicated the lead hazard is largely removed.

THE NEED FOR MEDICAL SUPERVISION

A physician has been employed to make a careful physical examination of all new employees, and also to afford medical supervision of the workmen. Clinical observation and experience show that persons with physical defects, such as pyorrhea, anemia, nephritis and nervous disorders, should not work under conditions in which lead absorption is possible. Therefore, all persons who are employed in such an occupation should be required first to have a complete medical examination. This is not only imperative from the standpoint of protecting the workmen, but is also of the greatest value to the management in giving proper supervision and protection to those who are engaged in a lead industry. Owing to the fact that individuals differ greatly in susceptibility to lead absorption, medical supervision is required in order that shifts may be made so that those who are susceptible may be protected against prolonged exposure.

Our knowledge concerning the influence of occupation on disease is limited. Moreover, we do not know a great deal about the type or the extent of disease found in occupations. Statisticians have shown that industrial workers lose approximately eight days a year through sickness. This estimate would perhaps be higher in commercial and mercantile establishments because a "lay-off" is more readily obtainable. There is a definite need for more accurate information concerning illnesses in occupation and the loss of time incurred thereby. Unfortunately, only three states, New York, Ohio and Massachusetts, at this time require morbidity reports of all occupational diseases. One of the weakest links in the public health chain at the present time is the lack of industrial morbidity reports. In view of the already overcrowded industrial centers and the expansion of industries in all sections of our country, it is hoped that more attention will be given to obtaining reliable data concerning occupational diseases by local official health agencies.

SUMMARY

A careful physical examination of thirty-nine employees in an enameling plant led to a definite diagnosis of plumbism in fifteen cases (39 per cent), and a diagnosis of probable lead poisoning in eleven cases (28 per cent). In thirteen of the thirty-nine men plumbism was not present, but was potential.

The chief cause of lead poisoning was the breathing of lead laden dust resulting from the spraying of pieces of iron stoves with enamel mixture. This was done in booths, spray guns being used from which the mixture was discharged under 80 pounds of pressure.

The following corrective measures were instituted: (1) personal hygiene; (2) correction of unhygienic conditions in the plant, and (3) adequate medical supervision.

The importance of obtaining morbidity reports of occupational diseases is obviously a need with the increased expansion of industry.

A point of especial interest brought out by the examination of the thirty-nine men is that there was not a single person that could be given an absolutely "clean bill of health." The majority of the physical defects noted were encountered in individuals who considered themselves in good health, with the exception of those suffering from symptoms of lead poisoning. Moreover, the percentage of defects appears to be greater in this industrial group than would be encountered in individuals living under better social conditions.

ABSTRACT OF DISCUSSION

DR. A. J. LANZA, New York: The situation which Dr. Leathers has outlined is not an unusual one. It might be duplicated in almost any industrial center. The unusual feature in this case was the thoroughness with which the men were examined, and the utilization of the knowledge so gained in prevention. The statistics indicate that the number of deaths from chronic lead poisoning have diminished about one half in ten years. This should not mislead us into thinking that there has been a corresponding drop in the incidence of lead poisoning. It is frequent throughout industry, not so much in places where lead is manufactured, such as lead works and paint works, because in that type of business the hazard is recognized, but in plants where lead is used incidentally in one process in a general manufacturing plant and poisoning is not so apt to be detected. A great many employers take on a lead process in their plant without any realization at all of its dangers. In other plants, the risk of lead poisoning is not sufficiently brought to the attention of the industrial workers who are continually exposed without being aware of the fact. It is not unusual to see lead handled as if it were a perfectly innocuous substance. I had occasion recently to visit an establishment in which there was a very pronounced lead hazard. Two hundred men were engaged in lead soldering in one room. The fumes from the solder came through the room and leaded the other workers who were near them. The amount of sickness from gastro-intestinal diseases in this group was four times that of respiratory disease, whereas in the ordinary population that ratio is transposed. Workers frequently consulted their own physicians in this small town; yet there has not been a single case of lead poisoning certified to the state authorities or diagnosed on an insurance disability certificate. Nevertheless, lead poisoning had been occurring there for a number of years to my certain knowledge. This indicates a failure to appreciate how widespread lead poisoning is in many an industrial community. Physicians who treat industrial workers complaining of gastro-intestinal symptoms, combined with anemia, without apparently any definite surgical condition, should keep the possibility of lead poisoning in mind and make blood smears to determine the presence of stippled cells.

DR. HAVEN EMERSON, New York: I would like to ask Dr. Leathers whether he made any inquiry as to the reproductive history of the families concerned. English and European literature records what might be termed epidemics of stillbirths in the families in which industrial lead poisoning had occurred, and from studies that are still incomplete but have been going on for the past two years, it is obvious that one of the commonly unnoted results of widespread lead distribution is the interference with the reproductive life of the families. The husband was poisoned with lead at the time of conception, or the wife was poisoned during the pregnancy. There is a hazard both in stillbirths and in the mortality of the children in the first year of life.

DR. LOUIS HARRIS, New York: Dr. W. S. Leathers' observation that we do not seriously consider the widespread prevalence of lead poisoning in industrial communities deserves more than ordinary emphasis. Every one of us who is engaged in industrial medical service, or has been engaged in it any time, has felt at some time that the subject has been exploited tremendously in the literature. It takes only a little practical and personal experience to discover that such exploitation and emphasis with reference to lead poisoning is well deserved; and in line with this may I by indirection say that there, too, is

an opportunity for the general practitioner to take cognizance of an important field of medical service; namely, industrial medicine. Joint symptoms are an indication of lead poisoning and by no means insignificant. The practicing physician ought to bear them in mind. Dr. Leathers undoubtedly must have come across a group of cases, though he called them by a different name, that might be called properly "latent" or "potential" lead poisoning cases; cases which do not show gastro-enteric symptoms, or paresis or paralysis indicative of nervous system involvement, and yet in which examination of the blood and other signs are strongly indicative of lead poisoning. A metabolic disturbance of some kind, or the exhibition of potassium iodide without moderation, may precipitate symptoms in an individual of this type. That is by no means an infrequent condition. The reporting of industrial diseases, as of communicable disease, in itself does not serve any very valuable purpose unless such reports lead to constructive remedial action, whether that be clinical, public health or legislative, or in insurance compensation. It is well that three states should have blazed the path and made a beginning, but we cannot be enthusiastic about the results that have thus far followed, even in the acquisition of knowledge about the prevalence of lead poisoning. The reporting of occupational diseases is honored in the breach rather than in the observance by the general practitioner, which permits me once again by indirection to indicate that the chairman was well justified in showing that the private physician can serve by giving information as well as by corrective work—in other words, by obeying the law. Those are considerations that are extremely important. One other point in the course of the paper seems, perhaps, to warrant a word of caution. It was customary years ago to lay a great deal of emphasis on the drinking of milk as a possible preventive of lead poisoning. While that is not to be scoffed at, and I would not have Dr. Leathers for a moment think that I speak lightly of it, we have come to know that that is a very, very weak rod for support.

DR. E. F. SMITH, Swissvale, Pa.: Dr. Harris expressed the desire for more extensive figures on lead poisoning. As long as there is such a vast difference of opinion as to what constitutes lead poisoning, and what is only lead absorption, so long will statistics have little value. There is too great a difference in the bases of comparison. For instance, in the report from New York State, published and reviewed by Mr. Frederick Hoffman, nearly all the cases were reported from one factory. I have heard on good authority that this is because the one plant physician is a careful investigator, who has conscientiously reported all cases, even of a minor nature. On the other hand, there are many plants in New York City, similar to the one reported on by Dr. Leathers, from which no lead cases are reported, except those failing to "get by" the coroner. There is a large mass of statistics being gathered at the present time by a nonmedical man. So far as volume is concerned, it will be complete, covering most of the industries using lead in the United States, Great Britain and Germany; but when a nonmedical man investigates lead poisoning for the purpose of whitewashing the industry, and takes the word of the examining physician of each plant as to the incidence of lead poisoning, the difference in the number of cases reported by one physician and in the number reported by another is going to be so great as to render the report without significance.

DR. W. S. LEATHERS, Nashville, Tenn.: In making a survey of the health problems in Nashville we were fortunate in securing the cooperation and active assistance of Dr. A. J. Lanza in an investigation of industrial hygiene and medical service in industries. He visited thirty-five factories, collected and analyzed data, and presented a most interesting report on his observations. The first patient with lead poisoning referred to in our paper came to the hospital after the study on industrial hygiene was completed. The industry in which this person worked was, according to the report submitted by Dr. Lanza, the only one that showed conditions suggestive of the possibility or, in fact, the probability of an industrial hazard, so that the outcome of his observations was striking so far as the developments that occurred are concerned. In answer to Dr. Emerson's inquiry, we were unable to go into that phase of the study while the medical examinations were being made of the employees. However, after the examinations were completed, I interviewed the workmen individually, relative to the results of the physical examination, and also for the purpose of advising each of them concerning hygienic measures that should be consistently practiced to prevent a recurrence of lead poisoning. I found that it was not possible to assign any abnormality of childbirth, such as stillbirths, to lead absorption. A considerable percentage of the employees were young single men, and either those that were married had not been exposed to the lead hazard for a sufficient period of time, or their children were well grown prior to exposure. I have no doubt that there would have been hazards to childbearing had the time been longer, and had a larger number of persons been exposed. One of the instructive things that came out of this study was the interest created among the students who were taking the course in preventive medicine in the Vanderbilt University School of Medicine. Each of these men was required to make a study of the conditions at the factory in which the cases of lead poisoning occurred, and to write a paper, including an analysis of the medical examination of the thirty-nine men subjected to the lead hazard. I mention this because I think that in teaching hygiene and preventive medicine to medical students it is exceedingly important for us to have them come in contact with practical field problems, and to give them first hand knowledge when practicable. In regard to the question of advising the drinking of milk, this was done not so much because of its value in permanently preventing lead poisoning as to afford a more nutritious diet. The majority of the men involved were decidedly underweight, and the drinking of milk was most desirable in bettering their physical condition. However, since the research of Aub and his associates on lead poisoning, we know that a high calcium diet will cause the lead to combine with the bone, and although it may be liberated under certain conditions, it will afford temporary relief.

MANAGEMENT OF ACUTE CONDITIONS OF THE ABDOMEN

COMPLICATED BY MARKED ILEUS OR SEPTIC INVASION OF THE PERITONEUM *

DONALD MACRAE, JR., M.D.
COUNCIL BLUFFS, IOWA

Having performed thousands of laparotomies during the last thirty-five years, and having attempted the various technics advocated from time to time during this period, I have now practically discarded drainage of the general peritoneal cavity, but have established, almost as a routine, draining of the intestine in all doubtful cases. As a consequence my mortality in the desperate type has been reduced at least 50 per cent.

Drainage of walled off pus collections or extraperitoneal cellulitis, or the insertion of foreign material into the gangrenous or suspicious locations in order to render the part extraperitoneal (quarantine), must not be confused with the contamination of the peritoneum itself, which does not require drainage, for the very good reason that such drainage is impossible.

Although no claim is made for originality in the technic of jejunostomy, I believe that the extended use of the tube advocated in this paper to include all suspicious cases of any character, particularly in intussusception, is a step in advance. This, in addition to my objection to the employment of so-called peritoneal drainage and the type of closed tube used, is my reason for presenting this paper.

While the ancients doubtless performed enterostomy for the relief of those desperately ill from bowel

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obstruction, authentic reports of such operations may be found in the literature of several centuries gone by. J. E. Summers[1] records that Paul Barbette in 1676, Nucke a few years later, Renault in 1772, and Nelaton in 1858, each advocated an artificial exit for the fluids and gases distending the intestine.

Shede,[2] before the Congress of Internal Medicine in 1889, warmly advocated enterostomy. From his experience with two cases, he pointed out that the formation of an artificial anus might be not only a palliative but also a curative operation.

Thirty-five years ago, Mr. Grieg Smith[3] declared most emphatically that no operation for intestinal obstruction is complete if the patient leaves the operating table with a greatly distended abdomen.

In spite of the crudeness of the technic, recoveries sometimes followed.

Sir Bertrand Dawson has well said, "Infection and obstruction together, or apart, make all the ills from which a patient derives abdominal trouble."

Moynihan, after his vast experience, says: "There is no appendicitis without obstruction."

In a recent report of ninety-five cases in which operation had been performed for intestinal obstruction at Cook County Hospital, Chicago, Meyer,[4] stated that 78 per cent were due to postoperative adhesions. The location of the obstruction was usually in the lower portion of the ileum, and it occurs comparatively rarely after operation in the upper half of the abdomen. To my mind, the latter observation is important and favors high jejunostomy.

I am convinced that all inflammations or severe peritoneal irritations produce more or less obstructive symptoms. How often we are deceived when, on opening the abdomen for "acute obstruction," we find a twisted ovarian cyst. I have seen what seemed to be an obstruction of the bowel follow kidney injury and simple ureteral stone colic. Are we sure that peritoneal inflammations or irritations or both may not be the provocative factor in the production of obstruction? And is obstruction and not peritonitis the fatal agent? It is the general opinion that the acutely ruptured appendix produces death by spreading peritonitis. Here, again, is not the condition known as peritonitis the agency responsible, in many instances at least, for the obstruction of the bowel, the latter really producing the fatal issue?

Working on the theory that practically all obstructions are due to (1) mechanical interference in the normal intestinal lumen, (2) inflammation or (3) factors influencing the nervous mechanism, is it not possible that the relief of obstruction may be the all important objective for the surgeon? If I am correct in this premise, then obstruction and not peritonitis must be considered the chief death-dealing agency. This, then, brings me to the question of perhaps greater interest; namely, the cause of death in intestinal obstruction.

CAUSE OF DEATH IN INTESTINAL OBSTRUCTION

The literature on the subject is extensive and was reviewed recently by Ellis.[5] The literature contains four main theories regarding the cause of death in acute intestinal obstruction:

1. *Bacteremia.*—The theory that death is due to a bacteremia at first sight seems plausible. The fluid accumulating in the intestines above the obstruction acts as a very good culture medium. It furnishes all the requirements for bacterial growth. However, McClure[6] and others have definitely disproved this theory by showing that at death the heart's blood, peritoneum and organs are practically always sterile following simple obstruction.

2. *Perverted Secretion.*—Supporters of this theory state that after obstruction, the intestinal mucosa of the proximal segment secretes a toxin which, when absorbed, is fatal. Dragstedt[7] shows the fallacy of this by draining opened isolated loops of jejunum into the peritoneal cavity without toxic symptoms resulting.

3. *Dehydration.*—In 1912, Hartwell, Hoguet and Beekman[8] concluded that the water loss from drainage of the body fluids into the intestinal lumen above the obstruction was the cause of the systemic symptoms and the eventual cause of death. Rowntree has shown that the liquid secreted in twenty-four hours from the upper intestinal tract of the human being amounts to from 7 to 10 quarts. If such quantities are drained out, they must be replaced, but this factor alone does not seem sufficient to explain the cause of death in obstruction. In my own experience, before the practice of forcing fluids became popular, I found that enterostomies reduced the mortality more than 60 per cent. The freer the drainage, the better the prognosis.

4. *Toxemia.*—This theory holds that death, in acute intestinal obstruction, is due to the absorption of poisons, produced by bacterial action in the bowel fluids, which accumulate in the intestine above the obstruction. This theory has received almost universal acceptance. Davis and Stone showed that secretions of the normal intestine, when kept under conditions inhibiting bacterial growth, remain nontoxic; when the secretion is incubated so that its own flora may grow, it develops toxic properties in eighteen hours and produces the symptoms of acute intestinal obstruction when injected intravenously. Dragstedt's work[9] led to the opinion that the lethal substances are toxic amines, produced by the action of bacteria on proteins and their split products, and that immunity cannot be developed against them. He found also that the normal bowel mucosa has a selective protective action against toxins, but under the conditions of obstruction the bowel walls are rendered more pervious to toxins, because of their impaired nutrition resulting from the poor blood supply caused by distention.

Williams[10] of London has just recently reported a clinical and experimental investigation of the toxemia of intestinal obstruction with the results of treatment with appropriate antiserums. His work, if confirmed, will

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4. Meyer, K. A., and Brams, W. A.: A Clinical Study of Acute Intestinal Obstruction, Illinois M. J. **51**: 43 (Jan.) 1927.
5. Ellis, J. W.: Cause of Death in High Obstruction, Ann. Surg. **75**: 429 (April) 1922.
6. McClure, R. D.: An Experimental Study of Intestinal Obstruction, J. A. M. A. **49**: 1003 (Sept. 21) 1907. Hartwell, J. A., and Hoguet, J. P.: An Experimental Study of High Intestinal Obstruction, Am. J. M. Sc. **143**: 357, 1912.
7. Dragstedt, L. R.; Moorhead, J. J., and Burcky, F. W.: Experimental Study of Intoxication in Closed Intestinal Loops, J. Exper. Med. **25**: 421 (March) 1917
8. Hartwell, J. A.; Hoguet, J. P., and Beekman, Fenwick: An Experimental Study of Intestinal Obstruction, Arch. Int. Med. **13**: 701 (May) 1914.
9. Dragstedt, C. A.; Dragstedt, L. R., and Chase, C. S.: The Antigenic Property of Closed Intestinal Loop Fluid, Am. J. Physiol. **46**: 366 (July) 1918. Dragstedt, L. R.; Dragstedt, C. A.; McClintock, J. T., and Chase, C. S.: Intestinal Obstruction, J. Exper. Med. **30**: 109 (Aug.) 1919.
10. Williams, B. W.: The Importance of Toxemia Due to Anaerobic Organisms in Intestinal Obstruction and Peritonitis, Brit. J. Surg. **14**: 295 (Oct.) 1926.

open a new field for investigation of the problems of obstruction. His investigation was begun on the hypothesis that the toxemia of acute intestinal obstruction is due to the absorption of anaerobic toxins from the stagnant contents of the small intestine.

Bacillus welchii is the most important, abundant and most constant of the toxin producers of the intestines. It grows in a neutral or alkaline medium. With obstruction of the bowel, conditions are ideal for its growth, and this organism is present in enormously increased numbers.

The contents of the small intestine obtained post mortem from four cases of peritonitis and one of acute obstruction all contained large numbers of *Bacillus welchii*, and in six cases of acute peritonitis the intestinal contents taken during life all revealed many *Bacillus welchii* organisms.

The presence of *Bacillus welchii* toxin in the contents of the obstructed bowel toxin was demonstrated by animal inoculation. Of thirty-two inoculated mice, the lethal effects were obtained in twenty-one. Sixteen control mice that were protected with *Bacillus welchii* antitoxin were unaffected.

As a therapeutic test of the hypothesis, the administration of *Bacillus welchii* antitoxin serums was made in cases of peritonitis and obstruction. In cases of peritonitis with paralytic obstruction there was a marked clinical improvement, and in case of organic obstruction similar results were obtained; but it was impossible to differentiate between the effects of the serum and the effect of the successful operative relief of obstruction. In fifty-four cases of acute intestinal obstruction in which antitoxin was administered, the mortality was 9.3 per cent, as compared to the usual mortality of 24.8 per cent. The antitoxin was administered also in 256 cases of acute appendicitis with a resulting mortality of 1.17 per cent, as compared to the usual mortality of 6.3 per cent.

Perhaps in adynamic ileus the paralysis may well be due in part to the presence of *Bacillus welchii* toxin in the intestinal content, and the administration of the antitoxin may help to overcome this paralysis. Unfortunately, this antiserum is not yet available in this country, although it was supplied to Williams by the Burroughs, Wellcome Company of England.

CHEMICAL REACTIONS IN OBSTRUCTION

The chemical changes of the blood in intestinal obstruction have been described by Orr and Haden.[11] There is a rise in nonprotein nitrogen and urea nitrogen, a drop in the chloride content, and a rise in the carbon dioxide combining power of the blood. There is also a rise in the nonprotein nitrogen and a diminution of the chlorides of the urine. In one patient reported by Orr and Haden, 90 Gm. of sodium chloride was given in thirty-six hours, with only 1.8 Gm. appearing in the urine and without a rise above normal in the blood.

There is a similar loss of blood chlorides in pyloric obstruction with vomiting and in duodenal and gastric fistulas. The chloride ions find their way into the alimentary tract in the gastric juice and also in intestinal secretions, but this quota is returned under normal conditions through reabsorption to the blood stream. Recent studies by Walters[12] of the Mayo Foundation revealed a loss of chlorides in fistulous fluids sufficient to account for the decreased chloride content of the blood. Reduction of blood chlorides may also occur as a result of their secretion into an obstructed intestinal tract. This is illustrated by a recent fatal case of paralytic obstruction that I treated. The patient was brought in five days after the onset of an attack of acute obstruction. At operation, a gangrenous ruptured appendix, generalized peritonitis and paralytic ileus were found. The patient had not vomited, but the blood chlorides were reduced to 200 mg. per hundred cubic centimeters and the nonprotein nitrogen was 85 mg. In spite of the fact that this patient was almost moribund, he would have had a better chance had I drained the intestine and done nothing more.

TREATMENT OF OBSTRUCTION

The treatment of acute intestinal obstruction is best considered from the standpoint of prophylaxis and management, to the end that adhesions may be prevented. Surgical cleanliness in all open abdominal work is most imperative. All trauma to the peritoneum should be reduced to a minimum. There should be the gentlest handling of the tissues with the fingers and instruments. The use of dry gauze against the peritoneum is to be condemned. The frequent changing of the patient's position is of great importance.

The conviction is gradually gaining ground among surgeons that in the majority of cases in which it is practiced, the so-called drainage of the peritoneal cavity is either unnecessary or futile. Mikulicz, in 1884, first made the suggestion that the removal of a gangrenous appendix in the presence of purulent peritonitis can be followed by closure. Olshausen, in 1903, reported 1,555 laparotomies, of which 7.5 per cent were severe, and in none did he institute drainage. His mortality was no higher than that of other surgeons for similar cases in which drainage was done. Yates,[13] in 1905, showed conclusively that drainage of the general peritoneal cavity is impossible. Barr, in 1920, reported only 0.75 per cent of deaths in a series of 134 suppurative cases of appendicitis in which drainage was not done. Ombredanne, in 1920, urged closure without drainage in all acute abdominal cases, irrespective of the lesion found, provided the cause was removed. Brockman,[14] in a recent comprehensive review of the problem of drainage in acute appendicitis, points out that convalescence is smooth and shortened without drainage, and that there is not the danger of fecal fistulas, with the delayed convalescence caused by them. No amount of drainage will give the patient general resistance. He traces the evolution of adhesions with drainage. Following the removal of the drain, a residual abscess may be left; the pus becomes inspissated and later organized into fibrous tissue. The movement of the bowel stretches this, forming a band which later may cause strangulation.

With the cause of the infection removed in the presence of a generalized peritoneal exudate, I close the abdomen without drainage after doing what MacKinnon describes as a complemental jejunostomy. Even though an ileus is not present, the jejunostomy forestalls its possibility. Perhaps in the light of Williams' work with the anaerobic flora of an obstructed intestine, the admission of air through the jejunostomy tube may have some value.

11. Orr, T. G., and Haden, R. L.: High Jejunostomy in Intestinal Obstruction, J. A. M. A. **87**: 632 (Aug. 28) 1926.
12. Walters, Waltman; Kilgore, A. M., and Bollman, J. L.: Changes in the Blood Resulting from Duodenal Fistula, J. A. M. A. **86**: 186 (Jan. 16) 1926.
13. Yates, J. L.: Surg. Gynec. Obst. **1**: 473, 1905.
14. Brockman, R. S.: The Problem of Drainage in Acute Appendicitis, Brit. J. Surg. **11**: 690 (April) 1924.

Gangrenous appendicitis is the most common cause of generalized peritonitis. An important prophylactic measure against obstruction, paralytic or organic, is the early diagnosis and treatment of acute appendicitis. It is felt that the medical profession generally is more negligent and careless now in the early treatment of acute appendicitis than it was twenty years ago, for then the procedure was relatively new and was discussed more.

In the actual management of obstruction, prompt diagnosis and early operation are most important. The shorter the length of time before operation, the higher is the recovery rate. Among the twenty-one cases reported by Finney[15] in which operation was done during the first twelve hours there was a mortality of 11 per cent, while in those in which the operation was performed during the second twenty-four hours there was a mortality of 31 per cent.

AUTHOR'S METHOD OF RELIEVING OBSTRUCTION

In the first state of a mechanical obstruction without distention of the proximal bowel, the indication is to relieve the obstruction. In every other case of obstruction with distention, the problem of the surgeon is to empty the intestinal canal. When the patient's condition justifies it, the obstruction may be relieved when the drainage is made. In severe late cases, drainage of the water-logged jejunum is the definite objective. The cause of the obstruction is not a matter of immediate concern.

In these late cases, I make a small incision through the outer border of the upper part of the left rectus muscle under local anesthesia; the first distended loop of the upper jejunum that appears (if filled with fluid) is picked up, and a jejunostomy is made according to the following method: The assistant, milking the fluid away from the segment of intestine to be attacked, holds the bowel between his thumbs and index fingers. Hot salt gauze is packed about the field. Next, a through and through purse string of 0 0 plain catgut suture is placed. In the center of this, a small opening is made and a number 20 catheter is inserted to the extent of one-fourth inch. The needle, still holding the catgut, is passed through the edge of the catheter and firmly tied, care being taken not to shut off the lumen of the tube. Next a very fine silk purse-string subserous suture is placed and tied, while the assistant gently pushes the catheter deeper into the bowel. This is followed by a second silk suture. The catheter is then brought through an opening in the omentum, as advocated by Charles H. Mayo;[16] the peritoneum is sutured and the wound closed. By keeping a gentle pull on the catheter, the intestine and omentum are held in contact with the parietal peritoneum. In order to hold this position, a silkworm suture through the skin is tied about the catheter. If during the course of an appendectomy, for instance, it is found desirable to drain the intestine, the hand is passed upward and the highest loop of jejunum is delivered. The same procedure is followed, except that a stab wound above and to the left of the left rectus is made, through which long narrow forceps are passed to the larger abdominal opening. The blind end of the catheter is grasped and pulled through the stab wound. After the abdominal and pelvic cavity have been dried out with moist gauze, the abdominal wound is closed without drainage of the peritoneal cavity. It seems unnecessary to state that the abdominal wall is drained at each end and in the center down to the peritoneum.

In my hands, this simple method may be done in a very few seconds and is superior in after-results to any of the more complicated time-consuming technics. When confronted with pathologic changes of the large intestine only, I follow exactly the same technic, except that a rectal tube is used instead of the catheter, and of course the location of the tube's exit changes. In late cases, with marked distention of the large bowel and water-logged small intestine, it is better to perform jejunostomy as well.

The question may be raised, Why not do an ileostomy with a low obstruction rather than a jejunostomy? Bonney, in 1915, first suggested doing a jejunostomy for the reason that the segment of intestine close to the obstruction is distended by gas, while higher up the bowel is distended and water-logged with fluid. It is the fluid content that contains the toxic factors. However, Bonney's[17] method consumes time and often demands closure of the opening later, not only in order to obliterate a disagreeable fistula but to save the wastage of the gastric nourishment.

Before operation, the stomach should be washed, and also irrigated at frequent intervals after operation.

The administration of the sodium chloride solution used by Orr and Haden should be started by hypodermoclysis as quickly as possible after the patient is seen. The fluid supplies the water lost, and the sodium chloride replenishes the deficit in the blood stream. In severe cases, Orr and Haden attempt to administer 1 Gm. of sodium chloride per kilogram of body weight during the first twenty-four hours.

Williams, in his treatment of obstruction by gas bacillus antiserums, gives 80 cc. intramuscularly as early as possible and an additional 40 cc. intravenously in extreme cases. This is followed by daily doses of from 40 to 60 cc. intramuscularly until the bowels move.

Time forbids an exhaustive report of the various technics advocated since Bonney, who perhaps has opened the field to new conquests in the battle for life in the desperate case, for it must be remembered that up to this time an enterostomy was done only in the marked cases; it was more or less of the artificial anus type, with all its disagreeable features and frequent need of secondary operations.

The work of A. I. MacKinnon,[18] who in 1916 drained the upper jejunum by means of a small rubber tube, with a remarkable disregard for the factor responsible for the ileus, has not received the attention it deserves. Living only 40 miles from the MacKinnon home, I became impressed by his teachings and since 1916 I have utilized this method, at first cautiously, but later with greater and greater boldness, not only in the late cases, but also in all instances in which ileus is anticipated at time of operation. Again, the experience thus gained has caused me practically to discard "drainage" of the peritoneal cavity, regardless of the etiologic factor responsible for the obstruction or infection.

SUMMARY

1. In an obstruction of any character in which operation is performed extremely early (within from six to twelve hours) and which does not require resection, the wound may be closed without drainage of any character.

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2. In later cases (from twelve to twenty-four hours) surgical judgment and experience are in greater demand. One case may still be early and not require drainage, but when in doubt one should (1) drain the jejunum in septic peritonitis; (2) in mechanical obstruction, with or without resection, insert a catheter into the bowel a few inches above the seat of trouble, and in addition drain the jejunum if the small bowel is implicated.

3. In all intussusceptions, early or late, one should drain the bowel immediately above the affected segment. If resection is indicated, it is better to tie off, resect and do anastomosis later (except in adults when the condition is due to tumor). In late cases the jejunum should be drained.

4. In all late desperate cases of obstruction, whether due to mechanical factors or to infection, colostomy and jejunostomy together (duplex) may be necessary, depending on the location of the obstruction and the extent of invasion of the small intestine. Jejunostomy alone should be performed if the obstruction is due to peritoneal infection.

5. In those late appendicitis cases in which waiting for abscess formation may be desirable, one may wait if one pleases, but jejunostomy should first be performed.

6. Typhoid seems to me a field for drainage of the intestine in suitable cases.

7. In gangrenous strangulated inguinal or femoral hernias, one should open the abdomen near the midline, deliver the intestine through the opening, pack with hot wet gauze and proceed to a complete hernia operation. By this time a prognosis of strictured bowel may be made. Thus there is ample room to resect or drain as the case may be.

8. Sodium chloride solution as used by Orr and Haden under the skin or intravenously before and after operation is advised in connection with oft repeated blood examinations; irrigation of the stomach before and after operation (every four hours) is also indicated. Heat and the Fowler position are indicated in all cases. Intramuscular injection of gas bacillus antiserums is desirable when obtainable.

9. Drainage of the general peritoneal sac is unnecessary.

10. The technic of operation in a simple appendectomy may be taught to a third year medical student in a few hours. The surgical judgment, however, required to engineer a complicated late "acute abdomen" to the safety zone may tax the experience and ingenuity of the most cultured artist, and even he cannot impart to others that surgical judgment which can be gained, if ever, only by continuous and repeated observation of the various causes and effects in health and disease, manifested in its peculiar fashion by that most precious of all fabrics, the human body.

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ABSTRACT OF DISCUSSION

DR. EDWARD P. RICHARDSON, Boston: Jejunostomy has a very different place in septic invasion of the peritoneum from that in mechanical obstruction of the intestine. In advanced cases of acute obstruction of the intestine, I believe thoroughly in jejunostomy under local anesthesia. It is clear, however, that if an interference with the circulation of the bowel exists, due to strangulation, the patient will die from necrosis of the bowel wall and peritonitis. Therefore, if the symptoms or the physical examination suggest strangulation of the bowel, particularly if there is bloody fluid within the peritoneal cavity and provided it is possible to explore at all, it is well not to rely on jejunostomy alone. When patients are in relatively good condition, with active peristalsis, I still feel that if enterostomy is indicated, it should be performed nearer to the site of the obstruction instead of high up in the jejunum. I refer now to cases of obstruction of the large intestine in which the point of obstruction can be demonstrated, and to some cases in which it is in the terminal ileum. If the large intestine is involved, I would do a cecostomy, and when the obstruction is in the ileum, an ileostomy. In cases of septic invasion of the peritoneum, with associated paralytic interference in the intestinal tract, it is possible to stress too much the factor of toxic absorption from within the intestine. The intestinal mucosa, if the circulation of the bowel wall is maintained, is a fairly efficient barrier to the absorption of these toxins. These patients need water, dextrose and salt. They are suffering from starvation and dehydration as well as from toxic absorption from the peritoneal cavity. I, therefore, prefer to try other measures in the treatment of the peritoneal infection first; fluids intravenously, morphine in full doses, sitting posture, and particularly the use of a nasal catheter passed into the stomach to aspirate fluids as they collect. If there is persistent vomiting due to regurgitation from the small intestine, or distention, with peristaltic pain, the indications are clearly for jejunostomy. As a matter of fact, in our clinic it is performed in few cases of peritonitis. In regard to the treatment of jejunostomy, the fall in blood chlorides, associated with intestinal obstruction, is one of the factors concerned in the fatal outcome. The mechanism of this is as yet unsettled. If a catheter is placed in the jejunum, a lot of fluid is drained out. That fluid contains about 5 Gm. of chlorides per liter. Therefore, the blood chlorides must be watched. Haden and Orr found that dogs, following experimental obstruction without interference with the vascular supply, died more rapidly with jejunostomy than without. I believe that is due, in part, to the chloride loss. So in these cases with free drainage, we must consider that a great deal of salt as well as water is being lost, and be sure to replace it by intravenous or subcutaneous injection.

DR. J. SHELTON HORSLEY, Richmond, Va.: Confusion may result from classifying all obstructions together. Obstructions from paresis of the bowel due to infection are quite different from those due to mechanical obstruction. Those from paresis, as in peritonitis, and in conditions without mechanical obstruction, may do harm largely because of the increased tension which promotes the absorption of the toxic material in the free fluid of the peritoneal cavity, but as has been pointed out by Dr. Richardson, if the mucosa and the circulation of the bowel itself are intact, hardly a sufficient amount of toxic products is absorbed from the lumen of the bowel to make any material difference. Enterostomy without peristalsis can empty only a small loop of bowel. In mechanical obstruction, there are two very important subdivisions, one in which the mechanical obstruction is unassociated with a markedly deranged circulation of the bowel, as, for instance, in experimental work, in which a string is simply tied around the bowel, or in many of the obstructions due to cancer of the colon; and, second, the quite different type clinically in which there is gangrene or circulatory stasis of a considerable segment of the bowel. In the latter type of case, death is very rapid unless the condition is relieved. Symptoms of profound traumatic shock develop from the toxic products developing in the affected segment of bowel due to the strangulation. In the former type, death may be delayed almost indefinitely, provided dehydration is prevented and the chlorides are supplied. With regard to drainage, I feel, as does Dr. Macrae, that frequently it is employed without doing any particular good. But we cannot have a rule of thumb for all types of infection when they vary so widely. There may be a muddy fluid, which looks as though it were septic but which has few bacteria and many leukocytes and, probably, presents a high resistance to infection. On the other hand, there is a free fluid with an extremely virulent type of peritonitis from which the patient will die no matter what is done. But in between these two extreme types, there are cases in which drainage is beneficial not so much in a mechanical way, because the peritoneal cavity should not be considered as a closed sac to be punctured and drained, but

because the cavity is a sac of living tissue in which there may be an enormous amount of lymph fluid exudate, and a foreign body, such as a drain, tends to draw those fluids toward the drainage tract. There will be a reversal of the lymph flow, and instead of being absorbed, a large portion of it will come toward the foreign body, as a splinter in the toe will attract lymph fluid to it until it is expelled.

DR. DONALD MACRAE, JR., Council Bluffs, Iowa: In hundreds of cases we have better results without drainage of the peritoneal cavity. We have been taught that peritonitis is the fatal factor, and we are going to continue to think in these terms until some one awakens to the fact that it is all unnecessary. Drainage of the peritoneum is impossible, and the more desperate the case, the more absurd it is to drain. If the patient is going to die, he is going to die anyway, even with drainage. It is absurd to suppose that when a virulent streptococcus infection involves the whole peritoneum sticking a tube down in one spot will cause all the germs to crawl down in four hours—that is impossible. One can talk all one wants about drainage of the general peritoneal sac, but it is impossible.

I believe absolutely in what Orr and Haden do, but we have been draining the bowel long before Orr's time, and we feel that the freer the drainage, the more rapidly the stuff will drop out of the jejunum, and the more assured is the patient's recovery. For example, in one of the cases that I think is going to end fatally before morning, I insert a catheter tube into the jejunum, regardless of whether the condition is a local or a general peritonitis. I tried to show in my paper that it is peritonitis that produces obstruction, but the obstruction that kills, and it is a toxin inside and not outside the bowel that kills. I have operated in hundreds of these cases in which the whole peritoneum was infected, and in which I thought I was too late, but the patient would be well in forty-eight hours. I have seen patients with general peritonitis recover time and again after drainage of the bowel, many operated on long before we resorted to extensive introduction of the salt solutions, ten or twelve years ago. The freer the drainage, the better the results, salt or no salt.

Dehydration alone has been disproved as a fatal factor, and our work substantiates this, because it has been seen that the more fluid that comes out of the bowel the better, even before salt was used. And we can use this same tube to force salt water into the body. We inject salt water through the tubes into the jejunum. The intestine segments are not the same; I feel that every foot of the intestinal tract has some specific function, and one cannot take the contents of the lower end of the jejunum or of the ileum and pass them into some other part higher up without poisoning the patient, any more than one can take the feces from the rectum and transfer them to the stomach. The regurgitating and vomiting seen when these patients are nearly dead means that fluid is coming from below up and that the patient is poisoning himself by absorption from the intestine. If the condition has gone beyond that stage, nothing will save him. But I have seen any number of these patients who a few years ago would have died, who now recover through drainage of the upper jejunum. Our statistics probably are a little bit high, but it is because we tackled bad cases, and it is because we see many get well from drainage of the jejunum who formerly died.

All Dietary Deficiencies Impair Growth.—We find no dietary deficiency which does not eventually impair growth; hence in normal healthy animals, growth becomes a delicate index of the quality of the diet. Among human beings not living under such controlled conditions, it is not so easy to tell in a given case of retardation just what the factors in the situation are, since poor heredity, physical defects, hygiene and latent disease also affect growth. But because these other handicaps exist, it does not follow that diet is exerting no influence; nor that, because attention to diet does not immediately cause a child to gain in weight, food has little to do with undernutrition in children. Dietary factors operate slowly, but they are doing something to a child every day.—Report, Joint Health Committee, Health Education, p. 27.

CONTROL OF HICCUP BY INHALATION OF CARBON DIOXIDE*

REPORT OF CASES

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In his exhaustive treatise on the "Technic of Medication," Fantus [1] writes thus on the alveolar route of administering medication: "The lungs are a large sponge with air passages on one side and blood vessels on the other of a thin membrane, presenting an enormous absorbing surface of great vascularity. Volatile substances are absorbed so rapidly from this surface that, for these, inhalation furnishes an almost direct admission into the blood."

Now this sponge is in ordinary practice the field of operation for the anesthetist. His daily work in maintaining life during surgical operations requires him to be familiar with the interpretation of changes produced by the absorption of gases from this extensive surface. And is not the term anesthetist rather narrow? Is he not an inhalation therapeutist? In actual use the chief gases with which he is concerned are ether, nitrous oxide, ethylene, oxygen, and carbon dioxide; the first three, of course, are classed as anesthetics, and the last two as necessary adjuvants.

Speaking before this section at Chicago, in 1924, Yandell Henderson [2] laid the foundation for the present widespread use of carbon dioxide in medicine and surgery. I will quote just one sentence from his address: "Sword has found that cases of otherwise uncontrollable postoperative hiccup were controlled and the patient's life saved by inhalation of carbon dioxide."

Hiccup is generally merely a symptom of some general underlying condition; occasionally, as in the epidemic idiopathic type, it may be a disease in itself. But as a symptom it is annoying and troublesome, and often is a part of a vicious circle, which, without control, may have a direct bearing on a fatal termination. Therefore, any method of controlling even this one symptom may be a definite factor in rational therapeutics.

What are the mechanics of hiccup? Hiccup, or singultus, is a spasmodic contraction of the diaphragm, the largest and most important single muscle of respiration.[3] It is due to an abnormal stimulation of the respiratory center;[4] reflexly, through afferent fibers in the phrenic nerve in postoperative abdominal cases, but through some other mechanism in renal and infectious cases. But, whatever the cause, hiccup, when it occurs, interrupts the normal cycle of respiration. We know [3] that carbon dioxide in the strength of from 5 to 5.6 per cent with either oxygen or air is the best stimulus known for increasing the activity of the respiratory center.

With this maximum stimulation, is it not reasonable to suppose that the reflex or abnormal or lesser stimulation resulting in hiccup will be ineffective, and that respiration without interruption may continue? By a small series of cases, I hope to show that such is the case.

In the hospital cases the Henderson-Coburn machine has been used by the house officers. This delivers car-

* Read before the Section on Pharmacology and Therapeutics at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 20, 1927.

1. Fantus, Bernard: The Technic of Medication, J. A. M. A. **86**: 551 (Feb. 20) 1926.
2. Henderson, Yandell: Resuscitation, J. A. M. A. **83**: 758-764 (Sept. 6) 1924.
3. Sheldon, R. F.: Anesth. & Analg. **6**: 31 (Feb.) 1927.
4. Lewis, Dean: Boston M. & S. J. **194**: 913 (May 20) 1926.

bon dioxide in conjunction with air, and the amount can be regulated by a sight feed. In my private work, however, I have used the Gwathmey anesthesia apparatus, Seattle model, which can be readily transported and set up at the bedside. On the nitrous oxide-ethylene side oxygen tanks are connected, and on the oxygen-carbon dioxide side tanks of carbon dioxide. By use of the sight feed the percentages are calculated approximately, but not with perfect accuracy. If too deep breathing is

TABLE 1 (case 1).—*Epidemic idiopathic hiccup*

Time	Carbon Dioxide Administration	Freedom from Hiccup
10:08–10:18 p. m.	10 minutes	1 hour, 17 minutes
11:38–11:42	4 minutes	58 minutes' sleep
12:40–12:46 a. m.	6 minutes	By nurse, little effect
12:50–12:55	5 minutes	By nurse, little effect
1:07– 1:09	2 minutes	11 minutes
1:20– 1:25	5 minutes	45 minutes' sleep
2:10– 2:14	4 minutes	1 hour, 30 minutes
4:05– 4:10	5 minutes	2 hours
Oxygen supply gave out; no more at hand.		
8:47– 8:50½	3½ minutes	15 minutes
Food, followed by hiccup.		
9:22– 9:25	3 minutes	2 hours, 30 minutes
11:55–11:57	2 minutes	Lunch at 12:15
Hiccuped for one minute, then stopped. Through afternoon, occasional single hiccup. After supper, recurrence.		
5:15– 5:17 p. m.	2 minutes	No further hiccup

produced, or the patient complains of discomfort, the carbon dioxide percentage can be rapidly cut down, or if necessary the inhaler removed altogether.

REPORT OF CASES

CASE 1.—*Epidemic idiopathic hiccup.* A man, aged 49, a shoe repairer, had had a similar attack six years before of three days' duration, which was stopped by amyl nitrite. The present attack began eight days before. The patient had consulted five physicians without relief and then turned to an osteopath. On entering the hospital he was having a loud convulsive hiccup with every breath, and the respiratory rate was 40 a minute.

CASE 2.—*Hiccup during gas-oxygen anesthesia.* In a boy, aged 12, during an operation for excision of the semilunar cartilage in the knee, hiccup came on, and was unaffected by the raising or lowering of the plane of anesthesia. Along with the anesthetic carbon dioxide was administered, increasing greatly the depth of respiration. After eight breaths, the hiccup ceased.

CASE 3.—*Hiccup following gas-oxygen anesthesia.* A woman, aged 38, a nurse, had had repeated surgical operations, the last nine weeks previously under ethylene anesthesia. Following this there had been some hiccup, but it was controlled by

TABLE 2 (case 3).—*Hiccup Following Gas-Oxygen Anesthesia*

Time	Carbon Dioxide Administration	Freedom from Hiccup
1:41–1:45 p. m.	4 minutes	4 minutes
1:51–1:55	4 minutes	10 minutes
2:12–2:16	4 minutes	25 minutes
then intermittent. In 2½ hours had become steady		
4:27–4:28	1 minute	Nausea and vomiting
4:37–4:39	2 minutes	No further hiccup

morphine and atropine. The patient dreaded anesthesia and hated the sight of the apparatus. During the administration of gas and oxygen for the application of a plaster cast hiccup came on, and in the absence of carbon dioxide was controlled by rebreathing. The patient vomited all night, and the next morning began a constant hiccup with occasional vomiting.

CASE 4.—*Hiccup after laparotomy.* A man, aged 49, a plumber, seen eleven days after cholecystectomy, had had an intermittent hiccup, at times preventing sleep, but was in good general condition. When I first saw him, he was having a hard convulsive hiccup with each breath. Carbon dioxide was administered, about 4 per cent with air. The depth of respiration was definitely increased, but for the first two minutes hiccup continued at the same rate. For the next two minutes hiccup became less frequent, and after four minutes ceased. He was then free from hiccup for fifty minutes. Then it

TABLE 3 (case 4).—*Hiccup Following Cholecystectomy*

Time	Carbon Dioxide Administration	Freedom from Hiccup
Henderson-Coburn machine		
10:20–10:30 a. m.	10 minutes	50 minutes
11:29–11:49	20 minutes	None
11:52–11:57	5 minutes	None
Gwathmey Machine		
1:25– 1:35 p. m.	10 minutes (by nurse)	Gradual lessening
6:15– 6:25	10 minutes (6 breaths)	1 hour, 10 minutes
7:35– 7:40	5 minutes (by house officer)	4 hours
11:45–11:50	5 minutes (by house officer)	1 hour, 20 minutes
2:15– 2:20 a. m.	5 minutes (by house officer)	6 hours
10:42–10:48	6 minutes (7 breaths)	1 hour, 12 minutes
1:33– 1:38 p. m.	5 minutes (after 1 minute)	4 hours, 7 minutes
5:47– 5:50	3 minutes (by nurse)	None
5:53 vomiting	No recurrence	

returned, and for twenty minutes carbon dioxide was administered, in the same percentage. In order to increase the percentage, the portable Gwathmey was substituted, and with this, results improved.

TABLE 4 (case 6).—*Hiccup Following Appendectomy*

Time	Carbon Dioxide Administration	Freedom from Hiccup
10:08–10:25 a. m.	17 minutes	5 minutes
10:31–10:42	11 minutes	11 minutes
10:53–10:59	6 minutes	15 minutes
11:14–11:21	7 minutes	3 minutes
In spite of deep respirations, still a tendency to hiccup; but respirations were forced and this tendency was overcome. Patient stated that he felt the urge not only to hiccup, but also to vomit, but that he was so busy breathing he could not do anything else.		
11:25–11:30	6 minutes	51 minutes
From 11:35 a. m. to 12:26 p. m. patient slept, the first rest since his operation. He was awakened by hiccup.		
12:27–12:37 p. m.	10 minutes	9 minutes
12:47– 1:00	13 minutes	
At this time nursing attention was required, and raising and moving patient again started hiccup.		
1:15– 1:20	5 minutes	45 minutes
2:05– 2:15	10 minutes	15 minutes
2:30– 2:37	7 minutes	37 minutes
Nursing attention was again required; by this time nurse had been instructed in the use of the apparatus, but being otherwise engaged she was forced to let hiccup go uncontrolled for fifteen minutes.		
3:30– 3:39	9 minutes	21 minutes
4:00– 4:05	5 minutes	15 minutes
Hiccup from 4:20 to 4:35 stopped without aid. Slept from 4:40 to 5:25, forty-five minutes.		
5:35– 5:45	10 minutes	20 minutes
6:05– 6:08	3 minutes	2 hours, 6 minutes
8:14– 8:19	5 minutes	54 minutes, dozing
9:13– 9:19	6 minutes	27 minutes
9:46– 9:51	5 minutes	1 hour, 11 min., sleep
11:00–11:05	5 minutes	50 minutes
11:55–12: mdt. April 17	5 minutes	45 minutes
12:45–12:50 a. m.	5 minutes	1 hour, 40 min., sleep
2:30– 2:35	5 minutes	25 minutes
3:00– 3:05	5 minutes	2 hrs., 25 min., sleep
5:30– 5:35	5 minutes	2 hrs., 25 min., sleep
8:00– 8:05	5 minutes	55 minutes
9:00– 9:05	5 minutes	4 hours, 5 minutes
Dressing done	Distention less	
1:10– 1:15 p. m.	5 minutes	45 minutes
2:00– 2:03	3 minutes	1 hour, 7 minutes
3:10– 3:13	3 minutes	37 minutes
3:50– 3:54	4 minutes	2 hours
5:54– 5:56	2 minutes	All night
8:15– 8:18 a. m., April 18.	3 minutes	Comfortable day
10:05–10:09 p. m.	4 minutes	1 hour, 54 minutes
12:03–12:06 a. m., April 19.	3 minutes	No further hiccup
From then on, normal surgical convalescence.		

CASE 5.—*Hiccup after laparotomy.* A man, aged 61, a retired policeman, hiccuped forty-eight hours after cholecystectomy. Three minutes with the Henderson-Coburn inhaler brought twenty-four hours' relief; then he had occasional hiccups, which gradually ceased.

CASE 6.—*Hiccup after laparotomy.* A man, aged 51, seen first on the sixth day following an operation for removal of a gangrenous appendix with drainage, had had six days and nights of constant hiccup, with vomiting; he had had no rest or sleep, was getting his fluids subpectorally, and such nourishment as could be given by enemas; the abdomen was distended and he was pale and apprehensive. Withal his pulse was 100 and of fair quality. He had been seen by several consultants and it was their opinion that there was no surgical cause for his hiccup, and that if it could be stopped he had a chance for recovery.

TABLE 5 (case 9).—*Hiccup Following Drainage of Bladder*

Time	Carbon Dioxide Administration	Freedom from Hiccup
9:00– 9:05 a. m., Oct. 30..	5 minutes	2 hours
11:05–11:15	10 minutes	1 hour, 44 minutes
Recurred during lunch	Lunch finished	
1:30– 1:35 p. m.	5 minutes	3 hours
4:49– 4:54	5 minutes	1 hour, 21 minutes
6:45– 6:49	4 minutes	3 hours, 40 minutes
10:55–10:58		
10:58½–11:01½	6 minutes	4 hours, 32 minutes
3:47–3:50 a. m., October 31	3 minutes	No further hiccup

Administration of carbon dioxide brought cessation after seven breaths, but the inhaler was kept on for seventeen minutes. For one minute after the withdrawal of the face piece deep inspirations continued; then a period of apnea ensued for forty seconds, followed by gradual resumption of normal breathing. After five minutes, however, hiccup recurred and administration of carbon dioxide was again begun. The results are shown in table 4.

CASE 7.—*Hiccup after laparotomy.* A woman, aged 40, a nurse, had had a hysterectomy performed, February 6. Hiccup began during the night of February 7 and stopped after forty-five minutes. In the early morning of February 8 hiccup came on again and continued for three hours. With the administration of carbon dioxide for two minutes, the hiccup stopped on the third breath and there has been no recurrence.

CASE 8.—*Postoperative hernia in scar of old cold abscess.* A man, aged 70, a clergyman, had had an operation under ethylene anesthesia, November 27, for the repair of a hernia in the scar of an old cold abscess. The hospital record for November 29 states that hiccup was fairly well controlled by carbon dioxide. The patient, when interviewed, was enthusiastic over the relief given; but the house officer states that

TABLE 6 (case 10).—*Hiccups Following Cystostomy*

Time	Carbon Dioxide Administration	Freedom from Hiccup
12:15–12:19 p. m.	4 minutes	14 minutes
12:33–12:36	3 minutes	42 minutes
1:20– 1:25	3 minutes	1 hour, 6 minutes
2:33– 2:36	3 minutes	34 minutes
3:13– 3:14½	1½ minutes	9 minutes
3:25– 3:28	3 minutes	26 minutes
4:09– 4:12	3 minutes	24 minutes
4:38– 4:41	3 minutes	33 minutes
5:20– 5:23	3 minutes	32 minutes
6:11– 6:11½	1½ minutes	5 minutes

Supper; prenoctial care, etc.
Patient much exhausted, had occasional hiccup, but did not desire further inhalations. Hiccup was finally controlled with large doses of morphine and atropine.

he had great difficulty in persuading him to try, as the patient understood that carbon dioxide was a poison and took the inhalation much against his will.

CASE 9.—*Hiccup following cystostomy under local anesthesia.* A man, aged 65, retired, was seen on the fourteenth day after drainage of the bladder under procaine hydrochloride anesthesia preliminary to prostatectomy. For nine days he had been hiccuping almost constantly, but getting short periods of relief with massive doses of morphine. He had become much depressed mentally, and wanted to be left alone to die. He did not take kindly to the idea of inhalations, but was persuaded to try. Table 5 shows the results.

In this case the blood pressure was taken during the administration of carbon dioxide, and was found to rise from 160

TABLE 7.—*Hiccup Following Cystostomy*

Time	Carbon Dioxide Administration	Freedom from Hiccup
Feb. 5, 7:18– 7:25 p. m. ...	7 minutes	20 minutes
7:50– 7:55	5 minutes	8 minutes
8:05– 8:10	5 minutes	9 minutes
8:20– 8:23	3 minutes	14 minutes
8:41– 8:44	3 minutes	21 minutes
9:05– 9:08	3 minutes	1 hour, 6 minutes
10:15–10:18	3 minutes	48 minutes
11:07–11:10	3 minutes	49 minutes
Feb. 6, 12:00–12:03 a. m. ..	3 minutes	1 hour, 16 minutes
1:20– 1:23	3 minutes	36 minutes
2:00– 2:03	3 minutes	47 minutes
2:50– 2:53	3 minutes	42 minutes
3:35– 3:38	3 minutes	17 minutes
3:55– 3:58	3 minutes	1 hour, 2 minutes
5:00– 5:03	3 minutes	27 minutes
5:30– 5:33	3 minutes	1 hr., 42 min. sleep
7:20– 7:23	3 minutes	2 hours
9:25– 9:27	2 minutes	21 minutes
9:48– 9:51	3 minutes	18 minutes
10:09–10:11	2 minutes	29 minutes
10:40–10:42	2 minutes	38 minutes' sleep
11:20–11:21	1 minute	59 minutes
12:20–12:22 p. m. ..	2 minutes	18 minutes
12:40–12:42	2 minutes	38 minutes
1:20– 1:22	2 minutes	13 minutes
1:35– 1:36	1 minute	16 minutes
1:52– 1:53	1 minute	28 minutes
2:21– 2:23	2 minutes	42 minutes
3:05– 3:07	2 minutes	28 minutes
3:35– 3:37	2 minutes	38 minutes
4:15– 4:17	2 minutes	18 minutes
4:35– 4:38	3 minutes	52 minutes
5:30– 5:31	1 minute	9 minutes
5:40– 5:41	1 minute	27 minutes
6:08– 6:09	1 minute	16 minutes
6:25– 6:26	1 minute	14 minutes
6:40– 6:41	1 minute	28 minutes
7:09– 7:10	1 minute	20 minutes
7:30– 7:32	2 minutes	43 minutes
8:15– 8:17	2 minutes	23 minutes
8:40– 8:43	3 minutes	43 minutes
9:30– 9:32	2 minutes	8 minutes
9:40– 9:43	3 minutes	32 minutes
10:15–10:18	3 minutes	3 hours, 7 minutes
Feb. 7, 1:25– 1:27 a. m. ..	2 minutes	18 minutes
1:45– 1:47	2 minutes	43 minutes
2:30– 2:31	1 minute	49 minutes
3:20– 3:22	2 minutes	38 minutes
4:00– 4:02	2 minutes	38 minutes
4:40– 4:41	1 minute	19 minutes
5:00– 5:01	1 minute	29 minutes
5:30– 5:32	2 minutes	58 minutes
6:30– 6:32	2 minutes	3 hours
9:38– 9:40	2 minutes	30 minutes
10:10–10:12	2 minutes	23 minutes
10:35–10:36	1 minute	34 minutes
11:10–11:11	1 minute	39 minutes
11:50–11:51	1 minute	39 minutes
12:30–12:31 p. m. ..	1 minute	29 minutes
1:00– 1:03	3 minutes	22 minutes
1:25– 1:26	1 minute	1 hour, 9 minutes
2:35– 2:36	1 minute	19 minutes
2:55– 2:56	1 minute	34 minutes
3:30– 3:31	1 minute	31 minutes
4:02– 4:03	1 minute	26 minutes
4:29– 4:30	1 minute	25 minutes
4:55– 4:56	1 minute	21 minutes
5:17– 5:19	2 minutes	43 minutes
6:00– 6:01	1 minute	22 minutes
6:23– 6:24	1 minute	36 minutes
7:00– 7:01	1 minute	29 minutes
7:30– 7:31	1 minute	29 minutes
8:00– 8:01	1 minute	59 minutes
9:00– 9:02	2 minutes	23 minutes
9:25– 9:26	1 minute	39 minutes
9:55– 9:56	1 minute	29 minutes
10:25–10:26	1 minute	34 minutes
11:00–11:01	1 minute	14 minutes
11:15–11:16	1 minute	2 hours, 14 minutes
Feb. 8, 1:30– 1:31 a. m. ..	1 minute	29 minutes
2:00– 2:01	1 minute	1 hour, 14 minutes
3:15– 3:16	1 minute	44 minutes
4:00– 4:01	1 minute	1 hour, 9 minutes
5:10– 5:11	1 minute	39 minutes
5:50– 5:51	1 minute	59 minutes
6:50– 6:51	1 minute	39 minutes
7:30– 7:31	1 minute	1 hour, 50 minutes
9:21– 9:22	1 minute	18 minutes
9:40– 9:41	1 minute	6 hours, 54 minutes
4:35– 4:36 p. m. ..	1 minute	32 minutes
5:08– 5:10	2 minutes	25 minutes
5:35– 5:36	1 minute	1 hour, 24 minutes
7:00– 7:01	1 minute	29 minutes
7:30– 7:31	1 minute	19 minutes
7:50– 7:51	1 minute	19 minutes
8:10– 8:11	1 minute	39 minutes
8:50– 8:51	1 minute	14 minutes
9:05– 9:06	1 minute	24 minutes
9:30– 9:31	1 minute	1 hour, 14 minutes
10:45–10:46	1 minute	19 minutes
11:05–11:06	1 minute	54 minutes
Feb. 9, 12:00–12:01 a. m. ..	1 minute	1 hour, 14 minutes
2:15– 2:16	1 minute	44 minutes
3:00– 3:01	1 minute	No further hiccup

to 170 mm. of mercury. In about three weeks prostatectomy under ethylene anesthesia was done, and except for a setback due to cardiac failure on getting out of bed, convalescence was uneventful.

CASE 10.—*Hiccup following cystostomy under local anesthesia.* A man, aged 69, retired, seen seven days after cystostomy under procaine hydrochloride and after three days of hiccup, was very pale, with a red count of 2,000,000 even after transfusion, and a pulse rate of 120, at times irregular, the underlying condition being an extensive carcinoma of the bladder. At first he responded well to the administration of carbon dioxide, but he gradually tired of it, as he found that the exertion of taking deep breaths even for two minutes was more than he wanted to bear.

CASE 11.—*Hiccup following cystostomy under local anesthesia.* A man, aged 73, retired, had had a cystostomy under local anesthesia preparatory to prostatectomy. This was followed by constant hiccup, and when I saw him on the third day he was having a convulsive hiccup with each breath. This man gave the hardest fight in controlling hiccup, but was extremely grateful and welcomed the inhaler as a friend.

CONCLUSIONS

From such a small series it may not be possible to draw uncontrovertible conclusions. However, I believe that the following statements are justified:

1. Carbon dioxide, in proper strength, will control hiccup during its administration and for a varying period thereafter. In some cases there will be no recurrence.

2. Since it produces increase in blood pressure and exertion by muscular effort, it does cause some exhaustion and is therefore not advisable for an extended period in the extremely debilitated or in those to whom the marked respiratory effort would be more detrimental than the continuing hiccup.

3. The patient remains conscious, and the administration can be stopped at any time, at his request. Theoretically there might be danger of hemorrhage in postoperative cases, but it is hard to see how rhythmic diaphragmatic contractions would be more likely to loosen a tie or otherwise cause hemorrhage than the sudden convulsive hiccup. There is also the theoretical possibility of dissemination of infection; but even this would appear to be more likely with the hiccup than with the rhythmic respiration.

In most of the cases the patient has welcomed the carbon dioxide administration, as it has produced no discomfort and has stopped the hiccup on the second to the eighth breath. The only exceptions were the nurse who positively hated any anesthetic apparatus, and the much debilitated patient with cancer of the bladder, who could not stand the exertion of deep breathing.

31 Pinckney Street.

ABSTRACT OF DISCUSSION

DR. B. C. SWORD, New Haven, Conn.: In 1923 Professor Henderson suggested that I try carbon dioxide with the Henderson-Coburn inhaler, such as has been described by Dr. Sheldon for the treatment of postoperative distention. This I did with variable degrees of success. The point that aroused my curiosity relative to hiccups was this: Henderson had shown in the laboratory that carbon dioxide stimulates peristalsis. Some authorities believe that one of the causes of irritation of the phrenic nerve is diminished peristalsis. On that basis I tried the method in some cases of postoperative singultus, and my results were similar to those Dr. Sheldon reported. I believe it is generally accepted by most anesthetists that carbon dioxide is the best throttle for the control of the smooth anesthesia. Most of the surgical difficulties are often brought about by spasm, and it is a known fact that small inhalations of carbon dioxide during anesthesia will control this spasm.

ULCERATION OF THE URINARY BLADDER AS A LATE EFFECT OF RADIUM APPLICATIONS TO UTERUS*

ARCHIE L. DEAN, JR., M.D.
NEW YORK

My purpose in this paper is to describe a bladder lesion of specific etiology which may develop many months after an apparently successful application of radium to a carcinoma of the uterus.

Urologists probably will be called on to treat an increasing number of patients for this condition, in which the history, symptomatology and cystoscopic appearance strongly suggest carcinoma of the bladder, but no tumor is present. If the approved methods of treating carcinoma should be employed in these cases, it is likely that the results would be disastrous.

During the past year three elderly women have been referred to me because they were suffering from pyuria, dysuria and hematuria of considerable degree. The remote histories were of no especial significance except that each patient had been treated with radium for carcinoma of the uterus. The location of the primary tumor in two of the patients was the cervix; in the other it was the corpus. The uterine disease had regressed in each instance, and the patients had been free from symptoms of disease for from fourteen and one-half months to twenty-four months after the last irradiation. Then urinary difficulties set in.

The following abstract is from the hospital record of one of the patients. It is presented as the composite of all three cases, so little did they vary even in minor details:

CASE 1.—L. G., a woman, entered the hospital, Feb. 11, 1926, complaining of frequency of urination, pain on urination, especially at the end of the act, and the presence of blood in the urine. She stated that she had felt well in all respects from the time of her radium treatment, Aug. 22, 1924, until Jan. 20, 1926 (twenty-two days previously), when she noticed a burning pain on urination associated with the desire to void frequently. There was no apparent reason for this distressing situation. The following day the urine was red with blood for the first time. The woman consulted her family physician, who injected some medicine into the bladder but without giving relief. On admission there was a urinary frequency of every hour during the day and from eight to ten times during the night. Dysuria was present to a moderate degree, and blood colored the urine a light red. In general, the patient felt well and did not have knowledge of any recent loss of weight.

Vaginal examination did not reveal any sign of uterine disease, nor was any induration palpable about the bladder base.

A cystoscopic examination was performed without difficulty. One hundred and eighty cubic centimeters of reddish brown urine was withdrawn, together with a clot of blood. The odor of the urine was extremely offensive. It was of the character described as typical of a fungating bladder cancer. On the bladder base approximately 1 cm. posterior to the trigonum and a trifle to the right of the midline was seen a circular ulcer nearly 2 cm. in diameter, covered with grayish slough. With only a slight degree of bladder distention the lesion seemed to be situated in the smaller end of a blunt, funnel-like depression, but increasing the amount of the fluid medium caused a flattening out of the neighboring walls. However, even with the bladder well filled there was the suggestion of a zone of contracture surrounding the central ulcer. The mucous membrane was acutely inflamed all about the area of necrosis, and such a degree of edematous swelling was present that it gave a punched out appearance to the broken down center. The slough was impregnated with gritty deposit.

* From the Department of Urology, the Memorial Hospital.
* Read before the Section on Urology at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 18, 1927.

Urinalysis added little information. Pus cells, red blood cells, and bacteria of many kinds were the principal observations.

Specimens were removed from different parts of the lesion for histologic study. These were examined by Dr. James Ewing, who reported "ulcerating granulation tissue, chronic cystitis, fibrin and pus, no evidence of tumor."

With the possibility of tumor eliminated, for the following reasons we believed that we were dealing with a late irradiation reaction, sometimes called a delayed radium burn:

1. The history of a thorough irradiation to a nearby organ.

2. The presence in the bladder of an area of necrosis situated at the point nearest the site of the radium application.

3. The appearance of the lesion. While very closely simulating an ulcerating carcinoma, it differed not only from this condition in a few details, but also from any other ulcerating disease of the bladder mucous membrane. Histologic examination is a great aid to the clinical sense in ruling out carcinoma and tuberculosis, but a Hunner ulcer and certain of the encrusted ulcerating conditions of the bladder must be differentiated by a process of elimination.

The irradiation received by the three patients was as follows:

CASE 2.—B. S. *Epidermoid carcinoma of the cervix.*

July 7, 1924: 1,027 mc. hrs. to the cervix; bomb applicator.[1]
1,027 mc. hrs. to the right parametrium, bomb applicator.
1,027 mc. hrs. to the left parametrium; bomb applicator.

July 8, 1924: 3,168 mc. hrs. to the cervix; gold piece applicator.[2]
545 mc. hrs. to the cervix; bare tubes.[3]

Bladder symptoms began July 26, 1926, twenty-four months later.

CASE 3.—D. B. *Adenocarcinoma of the fundus uteri.*

March 17, 1925: 1,812 mc. hrs. to the fundus; gold tandem piece.

March 24, 1925: 2,200 mc. hrs. to the fundus; gold tandem piece.

April 27, 1926: 1,050 mc. hrs. to the fundus; gold tandem piece.

Bladder symptoms began June 4, 1926, fourteen and one-half months after the first irradiation.

CASE 1.—L. G. *Plexiform carcinoma of the cervix.*

Aug. 22, 1924: 2,282 mc. hrs. to cervix; platinum tandem applicator.[4]
990 mc. hrs. to cervix; bare tubes.

Bladder symptoms began Jan. 20, 1926, sixteen months after irradiation.

In making a critical study of the irradiation received by these patients, it is impossible to condemn any type of administration as the cause of the bladder ulceration.

The unfiltered bare tubes undoubtedly were followed by greater local irritation because they deliver much beta irradiation, but for this reason it is unlikely that distant structures could be destroyed by this agent alone in the dosage used in these cases. However, the gamma rays from the bare tubes added appreciably to the cumulative distant effect.

1. The bomb applicator, devised by Bailey, is a radium container which fits in the vagina. Lateral and backward irradiation is prevented by properly constructed walls, while forward irradiation with heavily filtered rays may be directed accurately toward any part of the pelvis.

2. A gold piece is essentially a tube of radium emanation encased in a cylinder of gold, the walls of which are 0.5 mm. thick.

3. Bare tubes are glass capillaries of radon and are buried in the tumor.

4. The platinum tandem consists of two platinum pieces arranged in tandem formation. A platinum piece is similar to a gold piece, but the filtration is 1 mm. of platinum.

In case 3, the most serious of all, only well filtered rays were employed, and although there were no signs of a violent local reaction, ulceration within the bladder progressed until the walls of the large blood vessels were opened.

We must assume that the quality of the irradiation given and the finer technical details of its administration were scrupulously correct, as the surgeons in each case were experienced and painstaking operators; furthermore, it is known that in the great majority of similar cases identical treatment is not followed by bladder injury. Therefore it can be concluded that the cause of the distressing complication was that the total dose was too great for these individual women.

While every patient must be irradiated thoroughly, nevertheless, on the basis of these three cases it may be apropos to suggest that a total dosage of 3,500 millicurie hours of radium applied to the uterus, with the usual filters, should be considered as bordering on the upper limit of safety.

The therapeutic use of radium may cause three well known irradiation reactions within the tissues treated:

1. The primary erythema appears usually within twenty-four hours of the time of application. This is simply a response to an irritant and is not a specific effect of irradiation.

2. A secondary erythema may become visible approximately twenty-eight days later. This probably is a specific irradiation reaction in the nature of a temporary vasomotor paralysis. The appearance time of this reaction depends somewhat on the amount of irradiation delivered, being earlier for larger doses.

3. A tertiary reaction or "delayed radium burn," the subject of this paper, rarely appears until a year has elapsed after the treatment. It follows only intense irradiation, and is a specific sequel to this form of therapy. When observed on the more accessible surfaces of the body, a white, avascular appearance is noted at first. Within a short time the center breaks down and ulceration occurs. Healing in these cases is notoriously slow. Histologic study explains the clinical facts since the microscopic picture is that of an obliterative endarteritis.

TREATMENT

The distressing subjective symptoms have been relieved readily by a prescription consisting of sodium citrate, 20 Gm.; tincture of hyoscyamus, 25 cc.; cinnamon water to make 120 cc.; one teaspoonful in water two hours after each meal.

The most satisfactory treatment of the bladder lesion discovered thus far consists of injections of mercurochrome-220 soluble into the empty bladder. To prevent undue irritation, the earlier instillations consist of 15 cc. of a 1:200 dilution, administered three times a week. Later, when healing results in greater toleration, the strength of the solution may be increased gradually to 2 per cent, the same quantity being used as before at the same time intervals. It is important that this treatment be carried on with regularity and persistence.

With the use of this therapy we find the subjective symptoms greatly relieved within a week. In case 1, the bladder ulcer was completely healed seven months after the first visit. Patient 2, who has been under treatment for four months, shows on cystoscopic examination only one-fourth as much ulcerating surface as at the first examination, and the inflammatory reaction has improved in proportion.

Patient 3, who received a second treatment of 1,050 millicurie hours a year after the initial 4,012 millicurie hours, died of a hemorrhage from the bladder in spite

of well directed efforts on the part of her local physician. This fatality occurred a month after the onset of bladder distress and three weeks after the termination of subjective symptoms. The escape of blood was sudden and overwhelming.

CONCLUSIONS

1. The application of radium to the uterus in doses greater than 3,500 millicurie hours may be followed by extensive destruction of the bladder mucous membrane. Such a degree of ulceration may occur as to cause a fatal hemorrhage.

2. When irradiation of the uterus by radium was followed by an ulcerating bladder lesion, there was an interval of at least a year between the time of the irradiation and the onset of bladder symptoms.

3. In these cases the age of the patient, the history of the present illness, the symptomatology, and even the cystoscopic examination strongly suggest the presence of a bladder carcinoma.

4. Before any treatment is begun, a biopsy always should be performed on ulcerating lesions of the bladder.

5. The nature of the ulcers of the bladder base secondary to irradiation of the uterus with radium is an obliterative endarteritis.

6. Since the condition is one of central necrosis due to an insufficient blood supply, it seems reasonable to suppose that treatment by destructive agents such as fulguration, the actual cautery, diathermy, or further irradiation would be followed probably by the formation of a vesicovaginal fistula.

7. After experimenting with many remedies, we believe that our most effective treatment has consisted of an alkaline hyoscyamus mixture administered by mouth in conjunction with mercurochrome-220 soluble instilled into the bladder. With the use of these agents the subjective symptoms have been relieved promptly, but complete healing requires several months.

30 East Fortieth Street.

ABSTRACT OF DISCUSSION

DR. E. L. KEYES, New York: In estimating the dosage of radium for tumors we have to decide how much each radium seed or bomb is going to affect the tumor and how much the tissues. Inevitably we cannot determine this quite precisely, in view of our inability to discern exactly where the tumor stops and normal tissue begins. I have had a case quite similar to the ones Dr. Dean has reported. The patient, who was about 50, developed a vaginal hemorrhage and came to me for direction. I made a sufficient palpation of the vagina to feel sure that she had a small carcinoma of the cervix, and sent her to a gynecologist for treatment. That was three years ago and the growth seems to be at least quiescent. But after two and a half years the patient returned with symptoms of hematuria and frequent urination. I had treated her several years before for pyelitis, and she thought that she had pyelitis again. The cystoscope showed a lesion in the midfundus, right over the cervix. This lesion was so small that I could not tell whether it was a carcinoma or mere ulceration without performing a biopsy, which I did not do. The lesion cleared up without any treatment whatever, and she has remained well for a year since that time. I have twice examined her cystoscopically and neither time could see any evidence of a lesion at the place where the ulceration had been.

DR. JOHN H. CUNNINGHAM, Boston: Dr. Dean has brought to our consideration a condition which may be considered as a new etiologic factor in disturbances in the bladder. He has explained what I have had a suspicion of for some time. In some, but not all, of the patients whom we have treated with radium for carcinoma of the cervix or for fibroids of the uterus, changes in the urine and symptoms of bladder irritability have occurred within from three to five weeks following irradiation. There did not seem to be any cause for this, other than the radium, and I believe that Dr. Dean has given the correct explanation of the etiology in these cases. I note that he divided the reaction into three groups, according to the time of onset and the degree of reaction. My experience has been with what he terms the second group; in other words, those cases developing in approximately twenty-eight days. The patients whom I have observed have had negative urines at the time of the employment of the radium, but within a period of from four to five weeks have presented themselves with the symptoms and urine characteristic of cystitis. I think that Dr. Dean's contribution is of much value, particularly so as good results are more talked about than bad ones in the use of radium. The bladder changes which he has described should not be passed unrecognized as a sequence to uterine irradiation, and I have no doubt that now he has brought the matter to our attention, it will be more commonly observed.

DR. B. S. BARRINGER, New York: I want to go a little bit further than Dr. Dean has in certain classes of these cases. I had one case in which no treatment whatever had any effect on the condition. The surgeons who get the radium sloughs on the tongue, cheek and mouth use a method which I think will have to be used in some of the bladder ulcers. That is, they fulgurate and burn the slough cleanly away, and they tell me that the patients immediately get rid of the pain and ulcerations and healing progresses nicely. I believe that in certain postradium burns of the bladder we shall have to open up the bladder and use this method. In the next case I see that does not react to the simpler methods, I am going to open up and burn off the slough to see whether this will not prove effective.

DR. CLARENCE G. BANDLER, New York: I have treated three cases of ulcer of the bladder following the application of radium to the uterus. In each instance the ulcer appeared from six months to a year following the last uterine application of radium. Two of these cases were handled rather simply by vesical lavage with sedative antiseptic medication, combining 2 per cent procaine hydrochloride solution with the mild antiseptic. This method of treatment was ineffectual in the third patient, and somewhat against my better judgment, I employed diathermy to stop the hemorrhage. This procedure somewhat increased the ulceration, but did arrest the hemorrhage. Two per cent procaine hydrochloride solution was introduced into the bladder and was left in place for one hour; then electrocoagulation was utilized for the ulcer, followed by slow, but complete healing. In two of these cases the ulcers were healed in from one to two months, but in the third case healing was not complete until five months had elapsed. I do not believe that an alkaline diuretic alone is of much service, as both acid and alkaline internal medication have been tried without satisfactory results. However, I am convinced that large doses of hyoscyamus, internally, will act as a satisfactory sedative for the vesical irritation.

DR. EDWIN BEER, New York: Perhaps the most marked irritation of the bladder that I have ever seen was the result of the application of radium within the cervix to produce amenorrhea. A more violent irritation of the bladder and adjacent peritoneum, suggesting peritonitis, I have never seen. This came on within four or six weeks following the application of radium in the cervix. In another case, in which the radium was placed in the cervix, the patient returned to me two years later for symptoms suggesting a bladder growth, and she presented much the same appearance as Dr. Dean has described. In this case I was able to resect the ulcer and suture the bladder, and she made an uneventful recovery.

DR. GEORGE GILBERT SMITH, Boston: I have seen five cases of this sort, most of them from one to two years after radium application. They were initiated by hemorrhage. The principal thing that has struck me has been the zone of edema which exists in a fairly symmetrical way about the ulcers. Carcinoma, as I have seen it, consists in an ulceration or a frank proliferative process under the mucous membrane, or on it, with abrupt transition into the normal

mucous membrane, but these radium ulcers showed a marked inflammatory zone about the central ulceration which was different from that of carcinoma. One of these cases was complicated by the presence of a large stone in the bladder. There was one case which fooled me entirely. It occurred about two years after irradiation, and the lesion had progressed to a much later stage than any of the others that I have seen. As one looked at it through the cystoscope, one saw a proliferative lesion on the floor of the bladder which looked exactly like a low, bushy carcinoma. There was no area of necrosis, and no edema anywhere about it. I knew that the patient had been given radium two years before, but made a note that I did not think this was a radium burn. I opened the bladder and when the base was stretched out flat, the following condition was seen: Over an area 3 cm. in diameter, the mucous membrane was thickened and whitened, appearing as a typical cicatrix, and arising from this at intervals were tufts of granulation tissue. What had happened was that when the bladder was not much distended these tufts of granulation tissue were drawn together, so that they bunched up in a heap and gave the exact appearance of carcinoma. In that case I treated the lesion by electrocoagulation, and the last time I saw the patient she was having a good deal of irritation and the lesion had not yet healed. I am glad to say that she was examined cystoscopically by two other men, who came to the same conclusion that I had reached. I learned a lesson from that case. I feel that this is a definite lesion which occurs much more often than would appear from the discussion today, and we should bear this in mind when we see patients who have received radium treatment of the uterus.

DR. OSCAR L. NORSWORTHY, Houston, Texas: I am glad that the gynecologist is given credit for being careful in his application of radium in the female pelvis, and for the use of other factors in the effort to prevent unfortunate results from occurring. I am sorry that these ulcers are referred to as radium burns. The condition is one of necrosis, due to increased fibrosis, and should not be termed a burn. The public has a wrong impression of radium burns. Similar delayed necrosis in old secondary fibrosis from other causes are not termed burns. We have no definite way of estimating the exact distance of malignant cells in treating malignant growths of the cervix. One should ascertain as nearly as possible the exact location of the cancer with reference to the bladder and rectum, and then place the radium applicator so that the cancer will receive the maximum, and the bladder and rectum the minimum, amounts of radium rays. The vaginal walls should be packed posteriorly and anteriorly, well away from the radium applicator, and the bladder kept empty, which will prevent much bladder and rectal irritation. The question of an indwelling catheter can be solved only in individual cases. Determining the location and character of cancerous infiltration, whether hard or soft, crater-formation or cauliflower growth; regulating the screening, dosage and location of radium, and the length of time used; packing the vagina and keeping the bladder and rectum empty are all necessary factors in preventing early and late complications.

DR. J. W. BARSON, Joplin, Mo.: Surgeons have almost stopped operating on carcinoma of the cervix, for the field is so limited that it is very difficult to get a good result if the condition is at all advanced. I feel that I would not attempt to do a radical hysterectomy if the cervix was much involved in carcinoma. We know that life is prolonged for a considerable period by the use of radium, and that is one reason for continuing to use it even though we do get the late lesions in the bladder. It is peculiar how differently radium affects different parts of the body. I know that in using radium on the feet, for instance, months afterward there will sometimes be an ulcer that is hard to heal. The same conditions about the face and head are easy to heal for the blood supply is good, and I think this has much to do with the reaction. I believe that these reactions, although they do occur, should not deter us from using radium in the cervix because of its marked beneficial effects.

DR. HERMAN L. KRETSCHMER, Chicago: This discussion shows the great interest in the subject of the effects of radium on the bladder when the radium is used for various pelvic lesions, and this possibility should be familiar to every urologist. I have seen another type of lesion, resulting from irradiation for fibroids, namely, the development of enormous strictures of the ureter, that evidently were the sequel of heavy doses of radium for fibroid tumors. Recently, we have had another type of complication following radium treatment. Some radium was inserted at the end of an operation for carcinoma of the cervix. Forty days later a ureterovaginal fistula developed. The only possible explanation for its development is that it was caused by the radium, since the fistula developed too late to have been the result of surgical trauma.

DR. A. L. DEAN, JR., New York: Among gynecologists who use radium, a very active discussion is now going on concerning the remote effects of radium applied to the uterus. I think the consensus of opinion is that they cannot prevent the majority of these effects, try as they may. Those gentlemen realize that when bladder effects occur, they must refer the patients to the urologist, and we must make the diagnosis. The penalty of wrong diagnoses is rather heavy. Referring to Dr. Cunningham's remarks, I would suggest that he note the condition of the bladder a year or two from now in the patients who have had the early effects. They are the patients who are likely to get the ulceration, as a result of obliterative endarteritis. The reaction following treatment is in direct proportion to the radiation used. The more intense the irradiation, the earlier the effects will be seen. The so-called radium burns which are now called tertiary radium effects were formerly described as occurring a year after treatment, but we know that intense irradiation will cause them to occur before that. I agree with Dr. Bandler that it is the tincture of hyoscyamus that helps these patients rather than the alkaline solution, and we give it in rather large amounts.

O-IODOXYBENZOIC ACID IN THE TREATMENT OF CHRONIC ARTHRITIS

REPORT OF THIRTY-ONE CASES

NORBERT C. TRAUBA, M.D.
BOISE, IDAHO

A. S. Loevenhart,[1] in 1910, used *o*-iodoxybenzoic acid in the treatment of seven cases of arthritis in Cook County Hospital, Chicago.

The use of this drug in arthritis was revived by Young in 1923, while at the University of Wisconsin, and continued by Young and Youmans [2] at the University of Michigan in 1924. Their results were reported at the Dallas session of the American Medical Association.

In September, 1925, Dr. A. G. Young of the Department of Pharmacology in the University of Michigan Medical School urged me to study the action of the drug in a series of cases in the Wisconsin General Hospital. Having received further advice as to procedure from Dr. A. S. Loevenhart of the Department of Pharmacology in the University of Wisconsin Medical School, I began using the drug on our first patients in October, 1925.

In addition to the twenty-one cases treated at the Wisconsin General Hospital, I am also reporting ten cases treated by Dr. E. E. Laubaugh and myself at Boise, Idaho.

PROCEDURE

The first form in which the drug was used was a 1 per cent solution prepared by neutralizing 1 Gm. of

1. Loevenhart, A. S.: Personal communication to the author.
2. Young, A. G., and Youmans, J. B.: The Use of O-Iodoxybenzoic Acid in the Treatment of Infectious Arthritis, J. A. M. A. 87:746-752 (Sept. 4) 1926.

o-iodoxybenzoic acid with 3.57 Gm. of barium-free normal sodium hydroxide, according to the method outlined by Dr. A. S. Loevenhart. Sterilization was assured by heating this solution in a water bath at 97 C. for ten minutes.

Injection was made intravenously by the gravity method, and from ten to fifteen minutes was allowed for the injection of 100 cc. of the solution.

A course of treatment consisted of eight injections given biweekly. The initial dose consisted usually of from 50 to 75 cc. of the solution, and the remaining seven doses consisted of 100 cc. each.

Unencouraging results with the foregoing method of treatment caused me to consult Dr. Young at the Hospital of the University of Michigan in July, 1926, where I observed some of their treated cases and their method of using the drug. On Dr. Young's advice and to make our methods conform to those with which they had obtained their results, we began using the ammonium salt of *o*-iodoxybenzoic acid. A 1 per cent solution of this salt was prepared by dissolving 1 Gm. of the salt in 100 cc. of boiling distilled water and filtering through filter paper. This solution constituted one intravenous dose, which was given under sterile precautions within one hour after preparation.

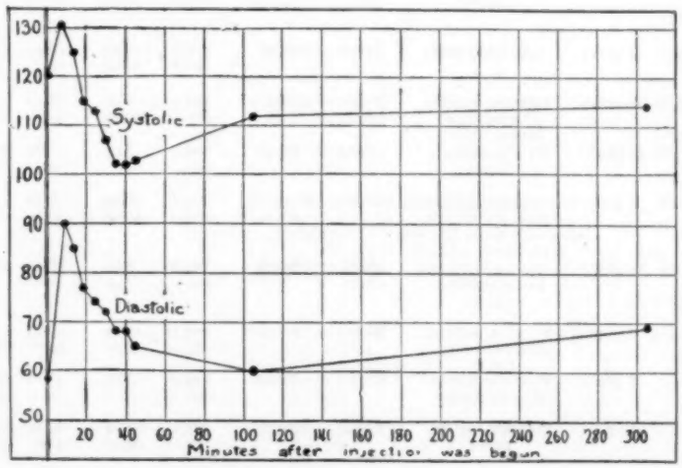
A course of treatment consisted of the size and frequency of dosage used with the sodium salt.

Patients 12, 14, 15, 19, 20 and 21 received such courses of treatment.

Because of the marked discomfort produced by the intravenous administration of the drug, we decided to try oral administration. The drug was put up in 0.5 Gm. capsules coated with phenyl salicylate; one such capsule was given the first day and two such capsules daily for the succeeding thirteen days. A rest of two weeks was then given and the course repeated in cases 2, 11, 16 and 17. Patients 11 and 13 received their first oral administration, Sept. 20, 1926. Oral administration was also used in case 2 and in cases 14 to 18, inclusive.

The patients treated by Dr. Laubaugh and myself received the Abbott preparation "Amidoxyl," intravenously, rectally or by both methods. When the rectal method was used, 1 Gm. of the salt, dissolved in water, was given thrice weekly through a size 20 catheter and the patient kept in bed for an hour following the injection. These injections were preceded by cleansing enemas.

No acute cases are reported in this series.



Representative curve of systolic and diastolic blood pressure following intravenous injection of sodium iodoxybenzoate.

OBSERVATIONS

The intravenous administration of the drug gave marked discomfort in every case; so much so that patients, 2, 7 and 10 refused further injections.

The following symptoms, in the order noted, were observed when the sodium or ammonium salt was used: Smarting of the tongue, of the nasal mucous membrane, of the conjunctivae and of the forehead; then generalized tingling of the skin followed by a burning sensation in the epigastrium. Nausea occurred frequently and three of our patients had a tendency to vomit after every injection. There was marked epiphora, flushing of the skin and perspiration. There were no untoward effects. Local extravasation of the solution produced only transient smarting at the site of injection.

Observations on blood pressures were made in the first eight cases and showed, uniformly, a sharp rise of from 8 to 30 mm. of mercury in systolic and diastolic pressures occurring within a few minutes after injection was begun and in spite of the usual decrease in pulse rate of from 2 to 14 beats a minute. This was followed almost immediately by a sharp decline in blood pressure to from 10 to 15 mm. below preinjection pressure. This was followed by a gradual rise to normal, requiring from one to five hours.

The respiratory rate usually decreased from 3 to 6 a minute, but at no time did apnea result.

A rise in temperature of from 0.5 to 1 degree F. was noted in several instances.

The blood picture was apparently unaffected by the drug, although improvement in the general condition was usually accompanied by improvement in hemoglobin and red blood cell count.

Patient 22, following the use of Amidoxyl, showed a decrease in kidney efficiency as determined by McLean's urea method.

Oral administration produced the following symptoms in the order named: Nausea of varying degree and duration and a burning sensation in the epigastrium. This was followed somewhat later by tingling of the skin and a feeling of warmth in the affected joints. Patient 2 reported an increase in joint pain during the first three or four nights following the first three administrations of each course. All symptoms were mild and bearable. Patients who had received both the intravenous and oral administrations readily preferred the latter.

Rectal administration proved as bearable as the oral method. In cases in which the intravenous method cannot be used, the rectal appears to be the method of choice.

TABULATED SUMMARY OF CASES

The tabulated summary of cases is based on the form used by Smith,[3] with certain additional data.

COMMENT

A frequent difficulty encountered with the intravenous method lay in finding a vein that could readily be entered, and this difficulty prevented injection of the full 100 cc. of solution in several instances.

Intravenous injection caused thromboses of the veins that were used, in 35 per cent of our cases, and in cases 22, 23 and 29 prevented further use of this method.

Other forms of therapy, consisting of diathermy and radiant heat, peptone or typhoid injections, or ortho-

3. Smith, Millard: The Use and Action of O-Iodoxybenzoic Acid in the Treatment of Arthritis, Boston M. & S. J. **196**: 305-310 (Feb. 24) 1927.

Summary

Patient No.	Name	Age	Type of Arthritis	Duration of Disease	Joints Involved	Joint Destruction	Ankylosis	Swelling	Pain	Muscle Spasm	Foci of Infection	Treatment with o-Iodoxybenzoic Acid: Begun	Ended
1	Mr. C. K.	30	Chronic multiple infectious	2 yrs.	Spine, fingers, wrists, elbows, hips, knees, ankles	Slight	None	Yes ++	Yes +++	Yes ++	Tonsils, teeth, G. U. tract	10/ 5/25	2/ 9/26
2	Mrs. H. M.	38	Chronic multiple infectious	8 yrs.	Fingers, wrists, elbows, spine, hips, knees, ankles	Slight	None	Yes ++	Yes +++	Yes ++	Teeth, tonsils, pelvic	10/ 6/25 16/ 5/26	11/ 4/25 12/ 9/26
3	Mr. C. P.	32	Chronic multiple infectious	1½ yrs.	Spine	None	None	None	Yes ++	Yes +	Prostate, cleared up	11/13/25	3/11/26
4	Mr. P. C.	24	Chronic multiple infectious	14 mos.	Hips, knees	Slight	None	Moderate ++	Yes +++	Yes ++	Tonsils, teeth, G. I. tract	11/ 4/25	2/25/26
5	Mr. M. L.	17	Chronic multiple infectious	5½ yrs.	Spine, elbows, hips, knees, ankles	Moderate	None	Yes ++	Yes ++	Yes ++	Tonsils, G. I. tract	12/ 3/25	2/25/26
6	Mr. J. N.	30	Chronic multiple infectious	14 yrs.	Spine, fingers, wrists, elbows, hips, knees, shoulders	Moderate	None	Yes ++	Yes +++	Yes ++	Tonsils, teeth, G. I. tract	12/10/25	3/ 2/26
7	Mrs. E. P.	48	Chronic multiple infectious	16 mos.	Fingers, wrists, elbows, knees	Slight	None	Yes +++	Yes +++	Yes ++	Gallbladder, G. I., asthmatic	12/22/25	12/31/25
8	Mr. T. W.	38	Chronic multiple infectious; asthma	12 yrs.	Fingers, wrists, elbows, knees	Slight	None	Yes +	Yes ++	Yes +	Asthmatic, G. I. tract	1/ 5/26	2/25/26
9	Mr. H. M.	25	Chronic multiple infectious; G. C.	4 yrs.	Hips, knees, ankles	Slight	None	Yes ++	Yes ++	Yes +++	G. U. tract	1/19/26	3/ 2/26
10	Mr. F. L.	48	Multiple infectious, chronic	4 yrs.	Elbows, knees	None	None	Yes +	Yes ++	Yes +	Tonsils, teeth	3/15/26	3/21/26
11	Miss H. R.	36	Chronic multiple infectious	15 yrs.	Elbows, wrists, fingers, hips, knees, ankles	Moderate	Fingers	Yes ++	Yes +++	Yes +++	Teeth, tonsils, pelvic	2/23/26 8/15/26	3/21/26 11/15/26
12	Mr. T. D.	19	Chronic multiple infectious	10 yrs.	Wrists, elbows, knees	Slight	None	Yes ++	Yes ++	Yes ++	Teeth, tonsils	7/16/26	8/11/26
13	Miss S. S.	34	Chronic multiple infectious	5 yrs.	Temporomandibular, spine, shoulders, elbows, wrists, fingers, hips, knees, ankles	Marked	Fingers, spine	Yes ++	Yes +++	Yes ++	Teeth, tonsils, pelvic	9/20/26	10/ 8/26
14	Mr. F. E.	28	Chronic multiple infectious; G. C	10 yrs.	Fingers, wrists, knees, ankles, spine	Moderate	None	Yes ++	Yes ++	Yes ++	G. U., oral	9/15/26 10/24/26	10/22/26 11/17/26
15	Mrs. L. G.	28	Chronic multiple infectious	7 yrs.	Fingers, wrists, elbows, knees, ankles	None	None	Yes ++	Yes ++	Yes ++	Teeth, tonsils, pelvic	9/14/26 10/16/26	10/ 8/26 10/31/26
16	Miss H. S.	55	Chronic multiple infectious	3 yrs.	Fingers, wrists, elbows, knees	Slight	None	Yes ++	Yes ++	Yes ++	Teeth, tonsils	11/15/26	11/30/26
17	Mrs. L. M.	56	Chronic multiple infectious	1 yr.	Fingers, wrists, knees	None	None	No	Yes ++	Yes +	Tonsils, teeth	11/15/26	12/27/26
18	Miss M. M.	41	Chronic multiple infectious	2 yrs.	Fingers, wrists, elbows, knees	Slight	None	Yes ++	Yes ++	Yes ++	Teeth	11/11/26 11/16/26	11/11/26 11/29/26
19	Mr. W. H.	43	Chronic multiple infectious	3 yrs.	Fingers, wrists, knees	Slight	None	Yes ++	Yes ++	Yes +++	Teeth, G. U.	10/12/26	11/16/26
20	Mr. P. T.	42	Chronic multiple infectious	14 yrs.	Fingers, wrists, elbows, knees	Slight	None	Yes ++	Yes +++	Yes ++	Oral	10/26/26	11/23/26
21	Mr. H. H.	25	Chronic multiple infectious	4 yrs.	Spine, fingers, wrists, elbows, knees	Moderate	None	Yes +	Yes +	Yes +	Oral	11/ 2/26	11/30/26
22	Mrs. A. P.	60	Chronic multiple infectious	6 yrs.	Knees	None	None	Yes ++	Yes ++	Yes ++	Teeth, tonsils, pelvic	11/29/26 2/25/27	2/25/27 3/15/27
23	Mrs. S. S.	27	Chronic multiple infectious	9 yrs.	Fingers, wrists, elbows, shoulders, hips, knees, ankles, spine	Slight	None	Yes ++	Yes +++	Yes ++	Tonsils, teeth, sinuses, G. I. trace	1/13/27 2/14/27 3/ 8/27	1/27/27 2/19/27 4/19/27
24	Mrs. A. F.	54	Chronic multiple infectious	8 yrs.	Fingers, spine, ankle	Slight	None	Yes ++	Yes +	Yes +	Sinuses, teeth, tonsils	4/ 7/27	4/26/27
25	Mrs. W. L.	52	Chronic multiple infectious	3 yrs.	Fingers, wrists, spine	None	None	Yes ++	Yes +	Yes ++	Teeth, sinuses, tonsils, pelvic, G. I.	12/21/26 3/22/27	2/ 7/27 4/ 5/27
26	Mr. L. W.	63	Subacute multiple infectious	2 mos.	Hips, metatarsals	None	None	None	Yes +	Yes +	Teeth	3/11/27 3/25/27	3/19/27 4/ 1/27
27	Mrs. C. W.	33	Chronic multiple infectious	2 mos.	Fingers, knees, ankles	None	None	Yes ++	Yes +	Yes +	Teeth, pelvic, G. I. tract	11/22/26	12/27/26
28	Mrs. A. P.	45	Chronic multiple infectious	6 yrs.	Knees, spine, shoulders, hips, fingers	Slight	None	Yes ++	Yes ++	Yes ++	Teeth, tonsils, sinuses	4/ 6/27	4/24/27
29	Mrs. J. R.	56	Chronic multiple infectious	7 yrs.	Knees, sternum	None	None	Yes +	Yes ++	Yes ++	Teeth, tonsils	11/ 2/26 3/ 3/27	2/15/27 3/16/27
30	Mr. K. I.	47	Sciatica; sacro-iliac relaxation	3 mos.	Sacro-iliac	None	None	None	Yes ++	Yes +++	Teeth, tonsils	5/ 9/27	5/17/27
31	Mr. C. C.	27	Chronic multiple infectious	6 yrs.	Temporomandibular, spine, shoulders, elbows, wrists, fingers, knees, ankles, toes	Slight	Spine	Yes ++++	Yes +++	Yes ++++	Teeth, G. I. tract	5/28/27	.....

of Cases

Treatment with o-Iodoxybenzoic Acid Grams of the Drug				Blood Examination						Relief to			
Intravenously	Orally	Rectally	Total	Date	Hemoglobin, %	Red Blood Cells, Millions	White Blood Cells	Other Forms of Treatment	Intercurrent Events	Swelling	Pain	Muscle Spasm	Recurrence
11	..	..	11	10/ 3/25 4/19/26	62 78	5,090 4,305	10,220 9,000	Diathermy, peptone intravenously, radiant heat	Hemorroidectomy, 3/6/26	Moderate	Moderate	Marked	1/6/27, pain increased; still unable to walk
5	..	..	..	10/ 7/25	75	4,720	8,800	Diathermy	11/22/25, sudden R. L. Q. pain, not appendix	No	No	No	12/28/26, unimproved
..	25	..	30	12/ 5/25	72	3,980	5,000						
12	..	..	12	11/12/25 5/13/26	52 75	4,720 4,700	13,250 8,900	Milk intramuscularly	3/15/26, acute flare-up	.....	Yes	Yes	Yes, August, 1926
12	..	..	12	11/12/25 5/13/26	73 74	4,740 4,600	10,000 6,600	Orthopedic traction	12/13/25, peritonsillar abscess	Yes	Yes	Yes	6/1/26, ankylosis of hips
9.5	..	..	9.5	11/23/25 4/14/26	53 50	4,000 4,110	5,800 10,600	None	None	Slight	Slight	Slight	4/16/26, slightly improved
10	..	..	10	12/ 7/25 4/21/26	65 70	5,130 4,060	8,400 6,000	Diathermy, radiant heat	Frequent exacerbations	None	None	None	4/21/26, new involvements in addition to old ones
2	..	..	2	11/17/25 3/16/26	65 38	4,085 3,330	9,800 13,350	Diathermy, radiant heat	Cholecystectomy and appendectomy, 10/26/25	None	None	None	3/18/26, no relief
7	..	..	7	12/31/25 4/10/26	80 68	4,560 3,980	15,400 9,000	Ephedrine for asthma (effective)	None	Moderate	Moderate	Moderate	4/10/26, moderate relief
9.5	..	..	9.5	12/ 8/25 5/13/26	72 70	5,290 5,060	11,550 5,300	Orthopedic, traction to hips	New involvements	None	None	None	5/15/26, new involvements
2	..	..	2	2/14/26 4/19/26	68 60	5,090 4,910	8,800 4,600	Symptomatic	Grip, cellulitis	Slight	Slight	Yes	4/25/26, improved
6	..	..	..	2/18/26	45	3,880	4,400	Diathermy, symptomatic	8/15/26, acute bronchitis	None	None	None	12/28/26, unimproved
..	25	..	31	5/19/26	42	3,690	4,600						
8	..	..	8	7/ 5/26 7/26/26	78 55	.....	.....	Symptomatic	None	Slight	Slight	Slight	8/11/26, new involvements
..	12	..	12	12/ 9/25 6/30/26	63 75	4,350 4,640	7,200 8,100	Mirion, 40 cc. intramuscularly, 12/7/25 to 8/24/26	None	None	None	None	12/28/26, unimproved
5	..	..	..	9/14/26	37	4,430	8,050	Symptomatic	10/2/25, flare-up of iritis	Slight	Slight	Moderate	11/27/26, unimproved
..	10	..	15										
4.5	..	..	..	6/ 9/26	58	5,320	14,700	Teeth extracted, 8/18/26; 9/2/26, orthopedic measures	None	Marked	Marked	Marked	12/28/26, definitely improved
..	9	..	13.5	9/30/26	66	5,150	18,250						
..	19	..	19	11/ 6/26 11/23/26	46 48	3,750 4,818	9,250 9,700	Teeth extracted, 11/13/26	None	None	None	None	12/16/26, unimproved
..	40	..	40	3/15/26 10/ 7/26	69 73	4,420 5,190	8,800 10,200	Tonsillectomy, 7/10/25	None	.....	Marked	Marked	12/28/26, much improved; began with tonsillectomy
0.5	..	..	..	10/12/26	58	3,700	6,000	10/15/26, 100 million typhoid; 10/21/26, intravenous peptone, 4 doses	None	Marked	Marked	Moderate	12/3/26, much improved
..	14	..	14.5	11/23/26	62	5,010	9,250						
6.5	..	..	6.5	10/13/26	64	5,100	8,600	Symptomatic, orthopedic, traction	11/20/26, renal colic	Moderate	Moderate	Moderate	10/30/26, moderate improvement
7	..	..	7	9/13/26	70	5,020	8,200	Symptomatic	None	Slight	Slight	Slight	12/17/26, slightly improved
7	..	..	7	11/ 1/26	45	5,220	10,800	Symptomatic	None	None	None	None	12/3/26, unimproved
8	..	..	..	11/24/26	68	3,880	3,100	Salicylates	Acute flare-ups	Moderate	Moderate	Moderate	5/1/27, yes, one week following last treatment
..	..	7	15										
2	..	..	..	1/17/27	69	4,514	7,600	Salicylates; 2/23/27, teeth extracted	Acute flare-up of knees after teeth were extracted	Marked	Marked	Marked	4/30/27, yes, 3 weeks following subsidence of first symptoms
..	5	..	..										
..	..	8	15										
..	..	7	7	3/31/27	56	4,530	5,200	Sinus drainage, symptomatic, "aolan," intramuscular	Passing through menopause	Slight	Slight	Slight	5/1/27, slight relief
7	..	..	..	6/ 5/26	73	4,320	3,900	Salicylates	Menopause	Slight	Slight	Moderate	3/19/27, yes; slight recurrence
..	..	4	11										
..	..	2	..	3/ 2/27	76	4,400	15,600	None	None	.....	Slight	Slight	5/1/27, slight relief
2	..	..	4										
4	..	..	4	10/21/26	81	4,720	4,900	Salicylates	None	None	None	None	5/1/27, no improvement
..	..	7	7	3/23/27	70	4,850	7,100	Oxyl iodide	None	Slight	Slight	Slight	5/1/27, slight improvement
14	..	..	..	6/19/26	77	4,992	6,700	Salicylates	None	Marked	Marked	Marked	Yes, 2 months after subsidence of symptoms
..	..	3	17										
..	..	6	6	4/28/27	85	4,700	11,300	Salicylates, heat, rest	None	.....	Moderate	Marked	6/7/27, markedly improved
4	..	..	4	5/25/27	50	3,860	9,410	Dietary	None	None	Moderate	Moderate	6/7/27, more joint motion except temporomandibular; slight general improvement

pedic manipulations and eradication of foci of infection, in addition to the use of symptomatic treatment, were employed in practically every case. Patient 8 had asthma, for which he received oral and hypodermic administrations of ephedrine, which gave decided relief from asthmatic symptoms for several weeks after the ephedrine was discontinued.

Intercurrent infections, operations and orthopedic manipulations occurred as indicated in the tabulated summary. Patient 7 had asthma for eighteen years preceding the onset of arthritis, and the former ceased with the onset of the latter. An infected gallbladder, suspected as a focus of infection, was removed, but at no time did this patient show any remission of symptoms.

In the treatment of chronic arthritis, many factors may apparently influence the degree of improvement obtainable with any specific form of therapy. Among these factors are the type of arthritis, the amount of joint destruction, the presence of ankylosis, the duration of the disease and the presence of foci of infection.

According to Young and Youmans and to Smith, the hypertrophic type of arthritis does not apparently respond readily to treatment with this drug. If much joint destruction has taken place, the degree of improvement to be expected must necessarily be small. True ankylosis, as distinguished from apparently complete ankylosis brought about by partial ankylosis with muscle spasm, does not, apparently, respond to any form of therapy except surgery, and the orthopedist can be of great help in restoring lost function to joints that have reached their limit of improvement with drug therapy. The greatest improvement in many cases is obtained in cases of short duration. If chronic arthritis is infectious, then the search for and the eradication of foci of infection should aid materially in obtaining great improvement. The foci of infection that must be looked for especially are sinuses, teeth, tonsils, postnasal, gallbladder, prostate, pelvic and gastro-intestinal. The presence of constipation and of pelvic foci of infection is perhaps too often overlooked. Diet and elimination should receive prominent consideration as therapeutic aids.

Age does not seem to determine how much improvement is to be expected, but the arthritis occurring at the menopause does not appear to respond readily to this form of treatment.

One must conclude that no single therapeutic measure can be used effectively in all cases of chronic arthritis, but rather that, in addition to general measures such as the eradication of foci of infection, anticonstipation diet and good elimination, such other specific forms of therapy may be used as they seem indicated. The results obtained by Young and Youmans and by Smith, and, perhaps, as shown in this series of cases, point to *o*-iodoxybenzoic acid as a therapeutic aid as effective as any that has been used in the past. The results obtained warrant further study to determine the exact therapeutic efficacy of this drug. Only after this drug has stood the test of time can the claims concerning its therapeutic efficacy go unquestioned. The cost of the drug is, however, almost prohibitive for experimental purposes in private practice, for its therapeutic value is as yet not sufficiently established to warrant placing the cost of treatment on the patient.

RESULTS

Marked improvement traceable to the use of *o*-iodoxybenzoates was obtained in cases 3, 15, 23, 29 and 30, or 16 per cent.

Moderate improvement was obtained in cases 1, 4, 8, 19 and 22, or 16 per cent.

Slight improvement was obtained in cases 5, 10, 12, 14, 20, 24, 25, 26, 28 and 31, or 32 per cent.

Improvement in cases 17 and 18 must be credited to therapeutic measures other than the *o*-iodoxybenzoate, for improvement began before administration of this drug was begun.

The remaining nine cases, or 29 per cent, showed little or no improvement.

Recurrences or flare-ups were noted in cases 3, 22, 23, 25 and 29, or 16 per cent.

SUMMARY AND CONCLUSIONS

The results of thirty-one cases of chronic arthritis treated with intravenous, oral or rectal administration of *o*-iodoxybenzoic acid show 16 per cent markedly improved, 16 per cent moderately improved, 32 per cent slightly improved, 29 per cent unimproved, and two cases of improvement, or 7 per cent, due to other therapeutic measures.

Those cases listed as "slightly improved" showed so little improvement in general that little credit can be given to the drug.

These results, while not as marked as those obtained by Young and Youmans and by Smith, are nevertheless encouraging. More study is necessary to determine the most efficacious form of the drug, the best method of administration, the size and frequency of dosage, and the mode of action.

Chronic arthritis has been a disease that has proved refractive to all previous "specifics." Past experience should teach us to be very conservative in our deductions as to the therapeutic efficacy of any new form of therapy.

ABNORMALITIES OF THE LOWER PART OF THE BACK*

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In previous papers I have called attention to variations in the lumbosacral region. These are so numerous and varied that it is difficult to determine the normal. In a paper read before the American Orthopedic Association in 1925, I[1] reported a series of so-called normal spines in patients who had never had backache. Fifty-five per cent of these showed varying degrees of abnormality and 4 per cent showed, according to the roentgenogram, variations in the transverse processes that might cause backache. In conclusion, I said: "It would seem from this study that variations in the lumbosacral region occur frequently in persons who have never had any symptoms of backache, and that some of these variations are very marked and severe. They also occur in persons who lead an active life and work hard. It is probable that these variations predispose to backache, but that posture, muscle relaxation and ligamentous strain are the actual causes."

The interest in lumbosacral variations is increasing, and their relation to backache is being given greater consideration. The interpretation of roentgenograms is sometimes difficult, and statistics based on these vary. In order to gain, if possible, some further information

* Read before the Section on Orthopedic Surgery at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 19, 1927.

1. O'Reilly, J. A.: Malformations of the Lower Spine Based on a Roentgenographic Study of Children and Adults, J. Bone & Joint. Surg. 7: 997 (Oct.) 1925.

I have examined 100 roentgenograms and 150 sacrums and fifth lumbar vertebrae.

The roentgenograms were of the lumbosacral region, and were taken in the roentgen-ray department of the Barnes Hospital, St. Louis. They were the regular daily run of pictures and included all departments, both hospital and clinic. Twenty-seven of these were from the orthopedic and seventy-three were from the other departments (table 1). Thirty-three per cent showed

TABLE 1.—*Abnormalities Seen in Roentgen-Ray Plates*

Total number of plates	100
Total number of orthopedic cases	27
Other cases	73
Total abnormalities	33
Orthopedic abnormalities	7
Total abnormalities	33%
Orthopedic abnormalities	26%
Other cases	36%

Type of Abnormality	Position				Percentage		
	Left	Right	Both Sides	Not Indicated	Total	Orthopedic	Others
Sacralized transverse process	4	3	4	2	13	7	15
Transverse process impinging on ala	3	4	2	..	9	19	5.4
Large transverse process not sacralized	..	..	1	..	1	4	0
Transverse process impinging on ilium	..	1	..	..	1	0	1.4
Overlapping ilium	..	1	1	..	2	0	2.7
Slipping articulation	3	1	..	1	5	0	7
Transverse process absent	1	..	..	..	1	0	1.4

	Number	Percentage
Bifid fifth lumbar	1	1
Bifid first lumbar	1	1
Tilting fifth lumbar	5	5

some variation of greater or less degree. In the twenty-seven orthopedic cases only 26 per cent showed variation. This is too small a number on which to base conclusions, but it suggests that variations are as common in normal backs as in backs requiring orthopedic treatment. This also corresponds with my earlier statistics (table 2).

The most common and important variation seen was the sacralized transverse process, either fused to the sacrum or articulating with it, on one or both sides. In 100 cases, 13 per cent showed this deformity, 4 per cent on the left, 4 per cent on both sides and 3 per cent on the right. There were two that did not show the side on which the deformity was found. In the orthopedic cases, this variation was present in only 7 per cent. This also follows closely the observations in my other series.

TABLE 2.—*Present Series Compared with 1925 Series*

Type of Abnormality	Present Series		1925 Series	
	Roentgenogram	Bones	Painful Backs	Normal Adults
Large transverse process	....	....	25%	14%
Sacralized transverse process	13%	9%	8.5%	14%
Bifid fifth lumbar	1%	0.6%	0	0
Bifid first sacral	1%	1.3%	0%	3%
Slipping articulation	5%	....	....	14%
Other variations	15%	7%	....	31%

Shadows showing an overlapping of the ilium or the ala by the transverse process of the fifth lumbar vertebra were more or less common. I do not believe, however, that these shadows are of importance in most cases. In an earlier work,[2] in which cadavers were roentgenographed and then dissected, it was found in most cases that there was considerable space between the posterior border of the crest of the ilium and the process. It is possible that the overlapping shadow of the transverse process and the ala of the sacrum may have more significance, but I am inclined to think that the significance is greater when the shadows appear to impinge. The position of the patient and of the tube, and the tilt of the sacrum all cause variations in these shadows. There is some variation even when the picture is taken in a standard position, so that a correct interpretation is difficult.

In five cases, the spinous process of the fifth lumbar vertebra seemed to be tilted upward, and there was a slipping of the articular processes in five cases. This condition is quite common and is accompanied by a haziness and an indistinctness in the roentgen-ray plate which may easily lead to confusion.

Of those abnormalities which might be on either side, eleven were on the left, ten were on the right, and nine were on both sides.

The roentgenogram may be misleading. Our ideas based on it are often at variance with the true conditions. We have had very little opportunity to compare

TABLE 3.—*Abnormalities of Sacrums and Fifth Lumbar Vertebrae*

Total number	150
Abnormalities	26
Percentage of abnormalities	17%

Type of Abnormality	Distribution and Percentage						Total Percentage
	Left		Right		Both Sides		
	No.	%	No.	%	No.	%	
Articulated with ilium	2	1.3	0	...	0	...	1.3
Sacralized transverse process fused	1	0.6	2	1.3	1	0.6	2
Sacralized transverse process articulating	6	4	1	0.6	1	0.6	5
Sacralized transverse process fused on one side and articulated on other	1	0.6	1	0.6	0	...	1.3

	Number	Percentage
Bifid fifth lumbar	1	0.6
Bifid first sacral	2	1.3
First sacral with characteristics of fifth lumbar	3	2
First sacral not fused	1	0.6
Incomplete fusion of sacral vertebrae	1	0.6

the actual anatomic conditions with those shown by the roentgen ray. Even the stereoscopic picture is inadequate, and in most cases the lateral view is useless in showing the relations of the transverse processes and other structures that are hidden behind the ilium. In order to interpret the roentgenogram properly, we should obtain a large number of roentgenograms of cadavers, and then compare the actual conditions found on dissection with those shown by the roentgen rays. We can also gain some information about lumbosacral abnormalities by studying the bones. With this intention, I made a study of 150 sacrums and fifth lumbar vertebrae, in the anatomic department of the Washington University Medical School. These bones were from cadavers dissected in the medical school, and were taken in order with no attempt at selection.

Seventeen per cent showed abnormalities (table 3). This is interesting when compared with the number seen in the roentgenograms. Variations of the transverse process were most frequent, as in the roentgen-ray series. Fifteen per cent showed sacralization of the transverse process of the fifth lumbar to a greater or less degree. In addition to the actual impingement and sacralization, the process, in a number of cases, was almost in contact with the ala. If the articulations slipped downward, the transverse process would

2. O'Reilly, Archer: Lumbosacral Region, J. A. M. A. 77: 1394 (Oct. 29) 1921.

undoubtedly come in contact with the ala or would cause a definite pressure on the tissues between the process and the ala. In one case, exostoses projected downward from the processes and rested on the alae.

The articular processes varied markedly in shape and size and in their angle. In many cases there seemed to be a depression in the posterior surface of the sacrum into which the inferior articular process of the fifth lumbar might have slipped. The shape of the articular processes was such that a downward, backward or lateral displacement of one or both of the processes would have been easy. The stability of these wide angled joints is secured mainly by the ligaments, so that slipping would seem a very simple process. An upward and forward displacement resulting in a spondylolisthesis, on the other hand, would require a severe trauma or a very marked modification in the tilt of the pelvis, and in the bones and ligaments.

Only two articular processes seemed to articulate with the ilium. This supports my observations in the dissection of the cadaver, and tends to show that impingement of the transverse process on the ilium is not very common.

The other variations are of anatomic and orthopedic interest, but they are rather infrequent. They show a potential weakness in the back, and may result in backache. The fifth lumbar which has become sacralized and fused to the sacrum will probably not give much trouble if the union is firm, nor will the first sacral which has not united and has assumed the characteristics of the fifth lumbar.

From a comparison of the roentgenograms with the skeleton and also with the cadaver, it would seem that the roentgenogram of the lumbosacral region tends to show a more marked variation than actually exists. This is probably due to the difficulty of trying to show a curved and complicated area in a flat picture. The roentgenogram of the sacralized transverse process of the fifth lumbar is, however, fairly accurate. Whenever possible, a stereogram of this region should be taken.

I believe from a study of the bones that the transverse process of the fifth lumbar vertebra may in many cases be a source of backache. Abnormalities of this process are more common than any other. In 5 per cent of the cases studied it articulated with the ala on one or both sides. The leverage at this point would render the joint subject to strain and might easily result in backache. Fusion on one side might increase the strain, either lumbosacrally or in the sacro-iliac joints. Another potential cause of backache is the instability of the articulations, which by slipping may cause strain at the lumbosacral articulations, or may cause an abnormally close transverse process to press on the ala.

Abnormalities in the transverse processes showed a rather strong tendency to occur on the left side. There were twelve on the left, seven on the right and four on both sides. To a less extent, this was also the case in the roentgenograms.

It will be seen by these statistics that variations in the lumbosacral region are quite common, and in the roentgenograms they seem to be more frequent in the normal cases than in those requiring orthopedic attention. Displacements and slipping of the articulations are also common.

These abnormalities are important not only in causing backache, but also from a legal point of view. The roentgenograms are often rather confusing, especially to one who has not had experience in interpreting pictures of the lumbosacral spine. Abnormalities, often extensive ones, exist in a number of persons who have never had backache. If a roentgenogram is taken after an accident, the natural tendency is to ascribe the variation to the accident, and it is often difficult, especially in cases in which there is a slipping or other displacement, to tell whether the condition was caused by the accident or is some abnormality that had existed before. As a result of this difficulty, backache and injury are seized on as a favorite cause for damage suits or claims for compensation. In order to minimize this condition, and also to protect the workers themselves, all men whose work is such that back injury might result should have roentgenograms taken before they are employed. The man with a potentially weak back should either not be employed or be given work that will not strain his back. The roentgenogram would then antedate the accident to prove or disprove any claim that might be made on variations appearing in the spine after the injury.

SUMMARY

Abnormalities of the lumbosacral spine are frequent. Thirty-three per cent of a series of roentgenograms showed some abnormality, and in the dried bones 17 per cent of abnormality was found. The most common was sacralization of the fifth lumbar spinous process—either fused to the sacrum or articulating with it. In a number of cases, the process was very close to the ala. Slipping and displacement of the articular processes is seen in a number of roentgenograms, and from a study of the bones it is seen that the articular processes show great variation, and that slipping might occur very readily. When this does occur, pain might be caused at the site of the slip, or it might possibly bring an abnormally close transverse process in contact with the ala. It would seem, then, that abnormalities of the spinous process are important potential causes of backache. The presence of abnormalities in the so-called normal back frequently leads to legal complications after an injury. To prevent this, and to protect the workman with a potentially weak back from serious back strain, all workers whose occupation might result in back strain should have a roentgenogram of the spine made before being employed.

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ABSTRACT OF DISCUSSION

DR. R. E. HUMPHRIES, New York: Backache is becoming a very important subject because of the large number of persons who apply for treatment of back pains. Certain deformities, such as sacralization of the fifth lumbar vertebra and abnormalities in the angle of the sacrum and spine, may weaken the back, but, as shown by Dr. O'Reilly, that does not necessarily cause backache. Persons complaining of backache should have a careful examination made of all their joints. Most patients who complain of pain in the back also have pain in the wrists, feet and legs which should suggest arthritis. The operative treatment of back pains is becoming more and more the vogue, and while I feel that many of these patients will be relieved of their pain by operation, a certain number of them will be relieved of their pain by rest. We must not make the mistake that the gynecologists have made. One well known gynecologist in New York found that 85 per cent of all the patients he had operated on were gynecologic cases and 15 per cent were orthopedic cases. His treatment failed to give relief in the latter group and succeeded in the gynecologic group.

DR. FRANK R. OBER, Boston: Dr. O'Reilly said that many of these patients did not have backache but presented abnormalities; while others complained of backache and also presented abnormalities. I see many cases of arthritis of the

spine in which roentgenograms show the presence of so-called hypertrophic or ostearthritis, with considerable involvement of the lumbar vertebrae, and yet these patients have no pain whatever. The reason they have pain probably is that somebody has told them that they have a spur on the spine. They go to work, develop a "crick" in the back, and attribute it to arthritis, but there are persons who have a sixth lumbar vertebra or a fourth lumbar vertebra or extra ribs or processes that extend down to the fifth lumbar vertebra and sacralized fifth lumbar processes, and in all these cases pain as the result of accidents may develop. Usually these patients develop sciatica, and most of them are relieved by some sort of support. If the patient has had a sacralized transverse fifth process and has lived for thirty or forty years in this condition, I see no reason for operative intervention. Many of these patients will be relieved by a properly fitted corset, by careful attention to their static difficulties, that is, foot strain or short posterior muscles, and by rest in bed if the pain is severe.

DR. SAMUEL KLEINBERG, New York: At the Hospital for Ruptured and Crippled we have not this peculiar complex of operating in every case of apparent malformation, but I was very much interested to hear Dr. O'Reilly say that it is advisable to examine many of these persons before they are employed. I wonder whether he has had any experience in the actual examination of a large number of men before they are employed. I have had much to do with compensation cases and I have not succeeded in furthering that idea, although I have advised that these employees be examined before they are employed. It seems to me that there would be a good deal of difficulty in obtaining such a routine practice, and I should like to hear Dr. O'Reilly's opinion on that point.

DR. C. A. STONE, St. Louis: The labor unions have a ruling that forbids the taking of roentgenograms of their members before they are employed, and a few other rules of that nature, which prevent our doing this type of work on them.

DR. E. S. JOHNSON, Boston: I should like to ask Dr. O'Reilly whether he believes that postural or mechanical changes in the back, which have developed over a course of years, are more likely to be due to faulty, incorrect habits and unsuitable work than to acute injury or disease. In the government services, we have seen many backs, which had apparently become industrially or vocationally unfit on account of wrong weight bearing or unnecessary habits of guarding one portion of the back or the extremities. The primary, and only, cause given was a rather indefinite bruise, strain, or crushing of the lower back, which had seemingly healed without demonstrable tissue change. After a variable period of months or years, a severe disability of mechanical type develops, and the claim for industrial loss is based entirely on the primary injury. By the time the secondary disability has developed, all actual pathologic changes in the tissue from the primary injury have disappeared. How far is such a claim correct, from a truly surgical standpoint, as regards causal factors, primary and secondary, dependent on definite injury or disease?

DR. J. ARCHER O'REILLY, St. Louis: I have not seen as many industrial cases as many of you have; but one of the reasons why I wrote this paper was to raise this question. I think that we all should try to educate the people, the laborer, the insurance companies and industrial boards to the necessity of making roentgen-ray examinations before the man is employed. For example, miners and workers of that sort, whose backs are subjected to great strain, may get a backache or sustain an injury to the back. On roentgen-ray examination one finds some abnormality in the back which may have been caused by the accident or which may have been there for a long while. Any one who has had experience with lawsuits along this line will appreciate what I mean. If men whose work subjected them to back strain could be educated into having these examinations made, it would save a great deal of trouble, and those who had potentially bad backs could be saved from a possible injury to the spine and actual backache. As to the cause of these variations, and why they should be on the left side more than on the right, I do not know. The condition may be developmental in origin, or due to faulty posture or something of that sort. I think that in treating these cases, posture or correction of posture may have a great deal to do in relieving the symptoms. It is very easy to understand how a faulty, tilting pelvis, or some other deviation, might very readily increase the pressure and consequently result in backache, and that if the posture was corrected it would relieve the symptoms without the necessity of operation.

RADIATION THERAPY IN MALIGNANT DISEASES OF THE THYROID GLAND*

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Our total series of cases of malignant diseases of the thyroid gland possibly includes 210 cases. Of these, however, ten cases have been classified as precancerous by the pathologists, and thirty-four are classified either as suspicious or as questionable, or have been under observation for too short a period to be included in this discussion. This report, therefore, is based on the observations in 166 cases of malignant disease of the thyroid gland in which the diagnosis is not questioned. All these patients have lived more than one year since the diagnosis was made, or are dead; in those cases in which a microscopic examination of the growth has not been made, the clinical course has been typical of malignant disease.

Of the 10,355 cases in our total series of cases of diseases of the thyroid gland in which operation or some other form of treatment has been carried out, approximately 1.6 per cent, therefore, have definitely been cases of malignant disease. In 65 per cent of this series the patients were women. The youngest patient with a malignant growth was 15 years of age, the oldest 83 years; in 1.5 per cent of the cases the patients were under 30 years of age and in 54 per cent they were between 50 and 70 years of age. In most of the cases an enlargement of the thyroid had been present for years; in 78 per cent, for more than two years. In 72 per cent of the cases in women the enlargement had first been noticed either at puberty or during pregnancy. Among the men the tumor had usually been observed comparatively recently, having been present, as a rule, for only a few months; the growth of the tumor had also been much more rapid in the cases that occurred in men.

CLINICAL DIAGNOSIS AND SYMPTOMS

The clinical diagnosis of malignant disease of the thyroid gland was difficult in at least half the cases because of the fact that small encapsulated neoplasms cannot be discovered. Among patients who were under 30 years of age, a clinical diagnosis of malignant disease was made in only 3 per cent; among the patients from 30 to 50 years of age, in 40 per cent, and in those over 50 years of age, in 80 per cent.

A sudden rapid growth of a preexisting goiter is one of the most important clinical evidences of malignant degeneration, though in some cases there were occasional periods of quiescence or of regression which apparently did not have any relation to physiologic functions.

The recurrence of a thyroid enlargement, also, always suggests the possibility that a malignant condition is present, this observation being supported by the fact that 8 per cent of the cases in this series were cases of

* From the Cleveland Clinic.
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recurrent goiter. When the history of a patient states that a growth in the thyroid gland has followed one or two operations for goiter, one should always suspect the presence of a malignant condition which either may have escaped recognition by the pathologist or may have developed in the remaining gland tissue.

A malignant tumor of the thyroid is usually unilateral, is irregularly nodular, and is firm or hard in consistency. When a tumor is fixed, the diagnosis is evident, and this fixation is usually the determining diagnostic sign. However, fixation is present in less than half of the cases.

Symptoms or signs of hyperthyroidism were present in 22 per cent of the series. This indicates the necessity of eliminating every possibility that a malignant condition may be present before subjecting a patient with hyperthyroidism to treatment by radiation, particularly when the patient is over 45 years of age.

In the early stages of malignant disease of the thyroid, the most frequently encountered complaint is of choking or of a sensation of constriction. Pain appears in a comparatively late stage of the disease, and indicates that the growth has involved the nerve trunks. Hoarseness and cough may be caused by pressure on the recurrent laryngeal nerve or by direct extension of the growth to the larynx. Difficulty in swallowing may be the result of pressure on the esophagus which may be displaced by the tumor, but it is often caused by actual infiltration of the esophagus by the neoplasm. Superficial venous engorgement of the neck and chest, which is associated with mediastinal obstruction in the circulatory system, is a late manifestation of rapidly growing tumors, such as sarcomas. Bleeding and hemoptysis is a late sign, occurring only seldom, and it always indicates that the growth has infiltrated into the trachea or esophagus with resultant ulceration.

Thyroidectomy or lobectomy was performed in 57 per cent of the cases in our series, and in 54 per cent of these the presence of a malignant condition was not suspected, the diagnosis being made by the pathologist. The best surgical results, of course, are obtained in the undiagnosed cases, as is evidenced by the fact that in 84 per cent of the patients who were operated on and are still living the presence of a malignant disease was not suspected. Among the cases in which a diagnosis of malignant disease was made, 31 per cent were thought to be operable. These figures indicate the impossibility of determining the curability by operation of cases of malignant disease of the thyroid. In no other organ, in fact, are the indications for operation on neoplasms and the probable limitations of operation so difficult to determine. If treatment by operation alone is to be successful, the neoplasm must be confined within its own capsule or at least within the capsule of the gland, so that the degenerated area can be removed in toto. After the growth has penetrated the gland capsule and has invaded the surrounding blood vessels and lymphatics, then it is almost certain that surgical treatment alone will not effect a cure; and it is in this type of case that irradiation offers the greatest possibility of relief.

OPERABILITY

It has now become our custom to consider as inoperable, at least from the standpoint of surgical curability, those cases in which there are clinical evidences that the growth has passed outside the gland capsule, this invasion being manifested by fixation of the tumor, by involvement of the lymph nodes, or by metastases.

Roentgenograms of the chest should be made in every case of thyroid enlargement, but especially when a malignant condition is suspected. Pulmonary metastases, in intrathoracic goiter, or a mediastinal lymph gland involvement may be present even in cases in which the enlargement of the thyroid itself appears to be very small. In our series metastases in the chest occurred eleven times, or in about 6 per cent of the cases.

The terminology applied to malignant diseases of the thyroid is in the greatest confusion, and one may find in the literature a number of terms which are used to describe similar pathologic types. It is our experience that the morphologic picture in itself is seldom a sufficient criterion whereby to differentiate types of malignant growths, a point which may explain the confusion which has arisen from the terminologies in the literature, which are based on attempts to classify cases according to the microscopic observations.

TERMINOLOGY

In the grouping of our cases we have preferred to use the simple, logical classification described by Dr. Allen Graham, who has kindly rechecked the pathologic diagnoses in most of the cases in this series. Dr. Graham points out that the present confusion is due to the following causes: (1) In no other organ do malignant tumors of epithelial origin proceed so directly from the basis of a preexisting benign tumor (the adenoma) as is the case in the thyroid gland; (2) in no other organ do malignant epithelial tumors (except chorioepithelioma) exhibit such a high incidence of metastasis through the blood stream; (3) in no other organ does the histologic appearance of the cells and tissues, both of the primary carcinoma and its metastases, so closely resemble the benign parent tissue in such a significant percentage of cases.

In the thyroid gland, as in any other organ, a malignant condition may develop in any of the cell structures. Parenchyma or stroma cells may become neoplastic, and the resultant tumor will have the same type of cells as does the structure from which it arises. Hyperplasia may involve the entire gland or one or more localized areas. Localized, discrete and encapsulated hyperplastic areas are known as adenomas, which are classified according to the predominant type of acini. We believe that about 85 per cent of all malignant tumors of the thyroid originate in adenomas.

MALIGNANT ADENOMAS

What we designate as a malignant adenoma is a type of carcinoma of the thyroid gland which in 90 per cent of the cases can be proved to have originated in a preexisting adenoma. This is the most confusing but also the most important type of malignant tumor of the thyroid gland, since so great a variety and so many combinations of morphologic transitions and degenerations of fetal, intermediate or mixed colloid adenoma may be found in a single tumor of this type, or even in a localized area of the gland.

Rarely is the tumor made up of only one type of neoplastic cell. There are usually areas in which the morphologic characteristics of fetal adenoma are mixed with others which show the characteristic structure of adenocarcinoma, medullary, scirrhous, papilliferous or spindle cell carcinoma or a carcinoma resembling sarcoma, or any combination of these. In only about one third of the cases is it possible, therefore, to make a diagnosis from the morphologic appearance alone. It is necessary to consider not only the cellular changes and structure but also the type of preexisting adenoma, the duration of the tumor and its rate of growth, the char-

acter and reaction of the stroma and capsule, and especially the involvement of the blood vessels or lymphatics. Sometimes it is not possible to prove that the malignant degenerations which are present have originated from an adenoma; therefore one can classify them only as of a "type undetermined." Malignant tumors which originate in benign adenomas are primarily encapsulated but may break through by direct extension or by invasion of the vessels. Malignant adenomas extend by metastasis through the blood stream as the result of the local invasion of the blood vessels, though the neoplasm itself may not have broken its capsule. If the tumor remains within its own capsule there is no dissemination through the lymphatics.

contrast to the true papillary carcinomas, they are as highly malignant as are other forms of malignant adenoma.

We believe that sarcoma of the thyroid gland is of comparatively rare occurrence, as it occurred in only nine of the cases in our series. The literature abounds in reports and descriptions of sarcoma of the thyroid, but if the great preponderance in the thyroid gland of the epithelial as compared to the mesoblastic elements is considered, one will realize that true sarcoma cannot occur very frequently. It is often difficult, however, to distinguish between sarcomas and certain malignant adenomas on the basis of morphology. The sarcomas are purely mesoblastic in character, and originate in the

TABLE 1.—*Results According to Confirmed Pathologic Evidences of Malignant Growths of the Thyroid*

	Number of Cases	Percentage of Cases	No Trace	Operative Mortality or No Treatment	Dead: 1 Year	Dead: 2-3 Years	Dead: 4-5 Years	Alive: 1 Year	Alive: 2-3 Years	Alive: 4-5 Years	Alive: 5 or More	Correct Clinical Diagnoses
Malignant adenoma	77	62.6	11	11	14	5	3	4	12	5	12	37
Type undetermined	11	9.0	3	4	2	1	..	..	..	1	..	9
Papillary carcinoma	14	11.3	2	1	1	..	1	2	1	2	4	6
Scirrhous carcinoma	4	3.3	..	3	1	..	..	..	..	..	..	4
Carcinoma-sarcoma	4	3.3	..	..	3	..	..	1	..	..	..	2
Sarcoma	9	7.3	..	4	4	..	1	..	..	..	..	8
Lymphosarcoma	4	3.3	1	..	2	..	..	..	1	..	..	4
Totals	123		17	23	27	6	5	7	14	8	16	70
Percentage results			13.7	18.6	22.0	5.0	4.0	5.7	11.3	6.5	13	57
Summary			Total, 78; 63.4%					Total, 45; 36.6%				

TABLE 2.—*Types of Malignant Growths of the Thyroid and Clinical Diagnoses*

	Total Cases	Diagnoses	Malignant Adenoma	Type Undetermined	Papillary Carcinoma	Scirrhous Carcinoma	Carcinoma-Sarcoma	Sarcoma	Lymphosarcoma	Total Pathologic Confirmation	Per Cent Correct Clinical Diagnoses	No Pathologic Changes	Per Cent Pathologic Diagnoses Made
Operation only	44	Total	23	2	6	2	3	6	..	42	50	2	95.5
		Correct	9	2	1	2	2	5	..	21			
Radiation only	28	Total	10	2	2	1	..	..	2	17	94	11	60.7
		Correct	9	2	2	1	..	..	2	16			
Operation and radiation	53	Total	29	3	5	1	1	2	2	53	43.4	..	100
		Correct	14	2	2	1	..	2	2	23			
Decompression, biopsy or no treatment	41	Total	5	4	1	..	..	1	..	11	90.9	30	26.8
		Correct	5	3	1	..	..	1	..	10			
Totals	166	Total	77	11	14	4	4	9	4	123	56.9	43	
		Correct	37	9	6	4	2	8	4	70			
Percentage of correct diagnoses			48.0	81.8	42.8	100	50	88.8	100	56.9		25.9	74.1

OTHER FORMS OF NEOPLASM

Scirrhous carcinomas of the thyroid are similar to scirrhous carcinomas in other organs; they have the same gross and histologic characteristics and are easily identified. In tumors of this type, fibrous tissue is predominant. The epithelial cells occur in masses of strands and there is seldom invasion of the blood vessels. Since it is not encapsulated, the tumor is adherent to the surrounding structures, and it destroys the surrounding organs and structures by direct extension.

Papillary carcinomas are usually associated with cystic degeneration; they are composed of multiple finger-like processes from the walls of acini which are lined with tall columnar epithelium, and they break through the stroma at their base to invade adjacent acini. They metastasize through the lymphatics and are of a low grade of malignancy.

A form of papilliferous growth which is not true papillary carcinoma occurs in localized areas in preexisting adenomas, and though the growth has a papilliferous formation, it should be classified among the malignant adenomas. These tumors invade the blood vessels but may break through their capsules, in which case they may extend to the regional lymph nodes. In stroma of the gland, the cell type therefore depending on the stroma cell in which the tumor originates.

Lymphosarcoma originates in the lymphatics of the gland, and has the characteristics of lymphosarcoma in other regions.

The carcinoma-sarcoma is also of rare occurrence and is a tumor of mixed type, showing both carcinomatous and sarcomatous elements. These tumors have abundant stroma, which in reality has the appearance of fibrosarcoma—at least, it shows numerous mitoses and atypical arrangements. In this type of neoplasm the epithelial elements also show the malignant changes of carcinoma. This tumor is usually considered carcinoma.

CLASSIFICATION AND RESULTS IN AUTHOR'S CASES

Our cases of malignant growths of the thyroid in which the pathologic diagnosis has been made are grouped according to the foregoing classification in table 1, which shows the number of cases, the incidence of each type and the final results in each group.

In twelve, or 15.5 per cent, of the cases of malignant adenoma the patients are clinically well. In not one of these twelve cases was the presence of a malignant growth diagnosed preoperatively, but in each the tumor

must have been well encapsulated so that it could be removed in toto. It is worthy of note that among the fourteen cases of papillary carcinoma four patients have lived for more than five years and nine have lived for more than one year since treatment was instituted. The sarcomatous neoplasms are by far the most malignant. Only one patient who had a carcinoma-sarcoma is still alive, and only one who had a lymphosarcoma; while of the nine patients whose tumors were diagnosed as sarcomas, all are dead.

As shown in table 2, the types that can most easily be diagnosed clinically are scirrhous carcinoma, sarcoma and lymphosarcoma. Malignant adenoma is diagnosed clinically in about half the cases, a percentage which corresponds to the proportion of the cases in which Supplementing operative treatment with radiation has brought about a distinct improvement in the results, though some of these patients had only one or two courses of comparatively moderate roentgen-ray therapy. In the groups in which operation and roentgen-ray radiation were combined, seven, or 18.2 per cent, are clinically cured, and a like number are living from four to five years after treatment and are clinically well. This would indicate the possibility of effecting a cure in 36.5 per cent of the cases treated by the combined method. Of the patients treated by radium followed by operation, each of the four who are living more than five years after treatment had a papillary carcinoma, a type of tumor that is comparatively benign. Roentgen-ray radiation alone was admin-

TABLE 3.—*Results of Treatment in All Cases of Malignant Growths of the Thyroid*

	Total Cases	Pathologic Diagnosis Confirmed	No Trace	Dead: Operative Mortality	Dead: 1 Year	Dead: 2-3 Years	Dead: 4-5 Years	Alive: 1 Year	Alive: 2-3 Years	Alive: 4-5 Years	Alive: 5 or More	Correct Diagnoses
Operation only	44	42	7	11	15	2	1	3	1	..	4	21
Operation and roentgen ray	38	38	5	1	4	3	2	2	7	7	7	14
Operation and radium	11	11	3	..	2	..	1	..	..	1	4	6
Operation, roentgen ray and radium	4	4	..	..	2	..	1	..	..	..	1	3
Roentgen ray only	22	12	3	..	6	1	2	3	7	..	..	11
Radium only	4	3	2	1	1	..	..	..	..	..	..	3
Roentgen ray and radium	2	2	..	..	2	..	..	..	..	..	..	2
Decompression or biopsy	11	10	3	2	6	..	..	..	..	..	..	9
No treatment	30	1	12	..	18	..	..	..	..	..	..	30
Totals	166	123	35	15	56	6	7	8	15	8	16	99
Percentage results		74.0	27.7	9.0	33.7	3.6	4.2	4.8	9.0	4.8	9.6	59.6
Summary				Total, 119; 71.7%				Total, 47; 28.3%				

TABLE 4.—*Comparative Summary of Results of Treatment of Malignant Growths of the Thyroid*

	Total Cases	Pathologic Diagnosis Confirmed	No Trace	Dead: Operative Mortality	Dead: 1 Year	Dead: 2-3 Years	Dead: 4-5 Years	Alive: 1 Year	Alive: 2-3 Years	Alive: 4-5 Years	Alive: 5 or More	Percentage of Correct Diagnoses
Operation only	44	42 95.5%	7 15.9%	11 25%	15 34%	2 4.5%	1 2.3%	3 6.8%	1 2.3%	.. ..	4 9%	50
Radiation only	28	17 60.7%	5 18%	1 3.6%	9 32.1%	1 3.6%	2 7.1%	3 10.8%	7 25.0%	.. ..	.. ..	94
Operation plus radiation	53	53 100%	8 13.2%	1 1.8%	8 13.2%	3 5.6%	4 6.6%	2 3.4%	7 13.2%	8 13.2%	12 22.6%	43.4
Totals	125	112 89.6%	20 16%	13 13.4%	32 25.6%	6 4.8%	7 5.6%	8 6.4%	15 12%	8 6.4%	16 12.8%	
Summary				Total, 78; 62.4%				Total, 47; 37.6%				

this type of tumor is localized. This proportion is again shown by the fact that of the cases treated by operation only 50 per cent were diagnosed preoperatively, and of the hopeless cases treated by radiation alone all were diagnosed clinically as malignant, though a microscopic examination was made in only 60.7 per cent. Of the cases in which operation was performed and postoperative radiation applied, only 43.4 per cent were diagnosed clinically, so that this group includes approximately the same percentage of cases in which the tumor was encapsulated, and hence could not be diagnosed clinically, as does the group in which treatment was by operation alone.

Thirty cases were hopeless from every standpoint and pathologic examination was not made; in all these cases, however, the clinical course was characteristic of malignant disease. Two patients died as a result of emergency decompression operations which were performed in the hope of relieving the extreme respiratory obstruction.

As shown in tables 3 and 4, of the patients treated by operation alone, only four, or 9 per cent, are cured; 18 per cent are living one year or longer after operation. istered in twenty-two cases in which operation could not be performed, and yet 25 per cent of these patients are living from two to three years after treatment, a fact which suggests that certain of these neoplasms must really be susceptible to radiation.

The chances of securing relief from malignant disease of the thyroid are shown by a comparison of tables 3 and 4. The operative mortality in this series was 13.4 per cent. Among these patients was one who had been treated preoperatively by roentgen ray and one who had been treated with radium. These cases are, however, properly included among the operative deaths. Two patients died in the hospital following decompression operations performed as emergency operations, and should therefore not be included in this list.

SUMMARY

Of all the patients, treated or untreated (table 3), 28.3 per cent are living more than one year, and twenty-four, or 14.4 per cent, more than three years since they first came under observation. Among the patients who could be treated (table 4), 37.6 per cent are living more than one year, twenty-four, or 18.8 per cent, more than

three years, and 12.8 per cent for five or more years after treatment was instituted. Apparently the best results are obtained by operation followed by irradiation, for in this group 22.6 per cent of the patients are "five year cures"; while twenty, or 36.6 per cent, are living more than three years after treatment. Of course, if this plan of treatment is followed in all cases, radiation will be applied in some cases in which the tumors are small, localized and encapsulated, and might therefore be cured by surgery alone; nevertheless, the final results indicate the advisability of applying radiation in every case of malignant disease of the thyroid gland. The explanation for this observation may lie in the fact that apparently the cellular structures of many malignant growths of the thyroid are sensitive to radiation because of their fetal or embryonic origin, and because metastasis must take place through small blood vessels or lymphatics which are also comparatively susceptible to radiation.

Euclid Avenue at Ninety-Third Street.

ABSTRACT OF DISCUSSION

DR. ALLEN GRAHAM, Cleveland: Whatever conceptions one may have concerning malignant tumors in general, either from the clinical, pathologic, biologic, or therapeutic standpoint, the clearest understanding of malignant tumors of the thyroid is to be derived from a study of these lesions themselves. The most reliable information is gained by a critical analysis of a series of cases competently observed, systematically treated and adequately followed. Females are more frequently affected than males, in the proportion of about three to one. A malignant growth has been reported as a congenital lesion, and in persons over 70 years of age. The greatest age incidence is in the fourth to the sixth decades. The incidence observed in surgical clinics is about 1 to 2 per cent of thyroids removed. The natural incidence, of course, is far less, but runs parallel to the natural incidence of endemic goiter. The hypertrophy and hyperplasia associated with exophthalmic goiter rarely, if ever, terminate in cancer. Colloid goiter (involuted hypertrophy and hyperplasia) does not appear any more prone to malignant degeneration unless associated with adenomatous nodules. The most important source of malignant tumors of the thyroid is the preexisting benign adenoma. Transition of adenoma to carcinoma is the pathologic process encountered in probably not less than 90 per cent of all cases. If we are to arrive at a common understanding of the relative value of surgery, irradiation or combination therapy, and the end-result of such therapy, it is important to know the type of lesion dealt with, and whether it is in the early or late stages. In this obviously disappointing field of medicine it seems that our brightest prospect for the future lies in the prevention of simple endemic goiter, thereby eliminating the adenomatous nodules which are the starting points for about 90 per cent of all malignant tumors of the thyroid.

DR. H. H. BOWING, Rochester, Minn.: I reported a similar study of 167 cases. Beginning carcinoma in an adenomatous goiter cannot be diagnosed clinically. In fifty cases in the inoperable group, biopsy was performed either on the thyroid or on a metastatic tumor, and the pathologist was able to make a diagnosis in about 98 per cent. The clinician as well as the pathologist can recognize the borderline or the inoperable case. In treating the inoperable case, I have been trying to determine a therapeutic procedure for the operable case. Carcinoma of the thyroid gland can be favorably influenced with radium and roentgen-ray therapy. It is not necessary for the surgeon to push the operation to the point at which great risk may be entailed. With this in mind he may remove a portion of the carcinoma and permit the remaining tissue to be treated by irradiation either by placing a rubber tube at the time of the operation, suitable for the introduction of radium a few days later, or by implanting needles bearing radium salts during the operation. As soon as the wound has healed, superficial radium packs may be applied to the operative field and roentgen rays to the possible local metastatic areas. There is quite a range of procedures to follow in treating the operable or borderline patient, and every endeavor should be made to individualize the treatment. One should not wait for these patients to return as soon as they recognize a recurrence of their old trouble; but one should see them at frequent intervals, and in this way try to recognize activity as soon as possible and then deal with it effectively. I am confident that the combination of operation and treatment with radium and roentgen rays offers an effective method of treating carcinoma of the thyroid gland.

DR. U. V. PORTMANN, Cleveland: It has been our experience that the treatment of thyroid diseases with radium has been somewhat less satisfactory than with roentgen rays on account of a tracheitis which has occurred in almost all the patients that we have treated with radium. I have found it necessary in each case to treat the upper mediastinum as well as the gland area, and this is practically impossible with radium. In treating malignant disease, it is important to prevent the occurrence of malignant disease if possible. About 2 per cent of our thyroid cases present malignant disease, and since 90 per cent of the malignant conditions of the thyroid gland originate in fetal adenomas, we feel that all adenomas of the thyroid should be removed as a prophylactic measure. This is especially true in later life during the years when a malignant condition most frequently develops. Prevention is more important than treatment.

EXPERIMENTAL SORE THROAT*

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EXPERIMENTAL SORE THROAT PRODUCED WITH SCARLET FEVER STREPTOCOCCI

In 1921, we[1] reported the production of experimental sore throat in human volunteers by the inoculation of pure cultures of hemolytic streptococci isolated from early, acute cases of scarlet fever.

The inoculations were made by swabbing pure cultures of the hemolytic streptococci over the tonsils and pharynx. In a series of thirty volunteers in which eighteen strains of streptococci were employed, twenty-three remained well after inoculation and seven developed sore throat. In most cases, the first symptoms appeared about forty-eight hours after inoculation. The onset was characterized by sore throat and general malaise, accompanied by a rise in temperature. There was acute swelling of the tonsils and reddening of the mucous membrane over the pharynx and tonsils. A polymorphonuclear leukocytosis was present in all cases. Enlargement of the submaxillary cervical lymph glands occurred in one, and typical follicular tonsillitis in another. The fever lasted from two to three days, subsiding gradually with improvement in symptoms. In none of these cases were there other symptoms suggestive of scarlet fever. There was no vomiting, no rash on the skin or on the palate and no desquamation. All the subjects recovered without complications.

These experiments demonstrated that hemolytic streptococci of scarlet fever origin are capable of producing, in certain persons, types of sore throat that would ordinarily be diagnosed simple angina or acute tonsillitis.

We[2] were able to show, by further inoculation experiments reported in 1923, that the same strepto-

* From the John McCormick Institute for Infectious Diseases.

1. Dick, G. F., and Dick, Gladys H.: Experimental Inoculations in Scarlet Fever, J. A. M. A. **77**: 782-785 (Sept. 3) 1921.
2. Dick, G. F., and Dick, Gladys H.: Experimental Scarlet Fever, J. A. M. A. **81**: 1166-1167 (Oct. 6) 1923.

coccus which produces typical scarlet fever in one person may cause an attack of simple sore throat in another and be incapable of producing any symptoms in more highly immune persons.

EXPERIMENTAL SORE THROAT PRODUCED WITH ERYSIPELAS STREPTOCOCCI

While erysipelas is known to follow infections of the upper respiratory tract, it rarely occurs as a sequel to scarlet fever, although the hemolytic streptococci of scarlet fever may persist many weeks in the throat and diseased sinuses of recovered patients. The infrequency of erysipelas after scarlet fever and the common occurrence of infections of the nose and throat before an attack of erysipelas suggested that the streptococcus found in the skin lesions of erysipelas might itself cause infections of the upper respiratory tract preceding involvement of the skin.

The following experiments were made to learn whether the hemolytic streptococci isolated from the skin lesions in erysipelas are capable of producing sore throat with or without the skin manifestations of erysipelas.

For these experiments, volunteers were selected who gave no history of having had erysipelas or of recent known exposure to it. They all had a normal temperature during two days' observation before inoculation, and a normal leukocyte count.

EXPERIMENT 1.—A hemolytic streptococcus was isolated from the edge of the skin lesion on the cheek of a 2 year old child who had a moderately severe attack of erysipelas. The culture was plated out on the surface of sheep's blood agar plates. The following day, a single colony from these plates was again spread on the surface of fresh sheep's blood agar plates. The second set of plates was incubated over night, and single colonies were transferred from them to sheep's blood agar slants. The slants were incubated forty-eight hours, and smears were then made from each, stained by gram and examined. The results indicated that we were dealing with a pure culture of hemolytic streptococcus. To verify this, some of the growth from each slant was plated out and the plates were examined, after incubation, for organisms other than the hemolytic streptococcus. None were found.

Meanwhile, the growth on the slant cultures was washed off in sterile broth. Part of the broth suspension was filtered through a sterile Berkefeld V filter and the filtrate was swabbed over the tonsils and pharynx of each of six volunteers. Observations were made twice daily for sore throat and fever. All the volunteers remained well for two weeks after inoculation. They had no sore throat, fever or skin lesions.

At the same time the filtered material was inoculated, some of the unfiltered suspension was swabbed on the tonsils and pharynx of two other volunteers.

Forty-four hours after inoculation, one of these volunteers, a man, aged 21, complained of sore throat and some general malaise. His temperature by mouth was 99.6 F. Four hours later, the temperature had risen to 101.4. The mucous membrane covering the pharynx and tonsils was reddened and the tonsils were swollen. The following day, the temperature was 101.8. The leukocyte count, which had been 7,600 before inoculation, was now 19,800, with an increase in polymorphonuclear neutrophils. The throat condition was about the same. On the third day of illness there was some improvement. The temperature fell by lysis, reaching normal on the fifth day. Recovery was uncomplicated. There was no rash or localized reddening of the skin at any time up to two weeks after recovery.

The second volunteer inoculated with the unfiltered culture was a man, aged 22. He remained well except for a slight rise in temperature, which began forty-four hours after inoculation and lasted three days. The highest temperature on the two days preceding inoculation had been 98.8 F. The temperature remained normal till the second day after inoculation, when it rose to 99.6, by mouth. It stayed between 99 and 99.8 till the morning of the fifth day after inoculation, when it was again normal. Accompanying the slight rise in temperature there was an increase in leukocytes from 8,000 to 12,200. There was no definite evidence of sore throat, and the volunteer did not complain of any symptoms.

EXPERIMENT 2.—A second strain of hemolytic streptococcus was isolated from the skin in a more severe case of facial erysipelas in an adult. Colonies were plated out and transfers made and examined as in the first experiment. Some of a twenty-four hour blood agar slant culture of this organism was swabbed on the tonsils and pharynx of a woman, aged 26. Forty-six hours after inoculation, she complained of sore throat and general malaise with headache. The temperature was 100.8 F. Twelve hours later, the temperature was 103 and the throat was more painful. The tonsils were much enlarged. The mucous membrane covering the tonsils, pharynx and anterior pillars was injected. The cervical lymph glands below the angle of the jaw were swollen and tender on both sides. The leukocyte count had risen from 6,350 to 22,000, with an increase in the polymorphonuclears. The next day, the condition was about the same. The temperature was still 103 by mouth. On the third day of illness, the throat symptoms were unimproved. The volunteer still complained of pain on swallowing. The temperature was 102. On the fourth day of illness, the temperature began to subside, becoming normal on the sixth day. By this time, the swelling of the cervical lymph glands had disappeared and the throat was considerably improved. There were no complications. During the two weeks after recovery, no skin lesions appeared.

EXPERIMENT 3.—A third strain of hemolytic streptococcus was isolated from the skin lesion in an exceptionally severe case of facial erysipelas occurring in an adult. After the precautions described above were taken to make sure that we were dealing with a pure culture of hemolytic streptococcus, part of the growth on a twenty-four hour human blood agar slant was swabbed on the throat of one volunteer. This was a woman, aged 24. Forty-one hours after inoculation, she had a temperature by mouth of 101.8 F. She complained of sore throat, general malaise and severe headache. Twelve hours later, the temperature was 103. The throat was painful and the headache persisted. The tonsils were swollen and reddened. There was diffuse reddening of the pharynx. The cervical lymph glands were not palpably enlarged. The leukocyte count had increased from 6,800 before inoculation to 31,000, with 80 per cent polymorphonuclear neutrophils. The next morning the temperature was 100.8, but by noon it was again 103. There was some improvement in the general condition, though the throat was still painful. On the morning of the third day of illness the fever began to subside, the temperature reaching normal in twenty-six hours. With the fall in temperature there was marked improvement in symptoms. Recovery was uncomplicated. There was no rash or inflammation of the skin during the two weeks after recovery.

A second volunteer, a woman aged 30, was inoculated with a twenty-four hour slant of the same organism twenty-four hours after the first volunteer was inoculated with it. This volunteer remained well except for a transient slight rise in temperature on the second day after inoculation, and slight enlargement of the cervical lymph glands below the angle of the jaw on both sides. Her throat was reddened, but she did not complain of any soreness in it.

In each case in which sore throat developed after inoculation, cultures were taken at the height of the illness. Mucus from the throat was plated on the surface of human and sheep's blood agar plates. All these cultures showed many colonies of hemolytic streptococci, which were isolated for comparison with the organisms inoculated.

SUMMARY

In these experiments, hemolytic streptococci obtained from the skin lesions of erysipelas produced, on inoculation, acute angina in three of five volunteers. The anginas were characterized by fever, leukocytosis and

the general clinical picture of ordinary sore throat or tonsillitis without the skin manifestations of erysipelas.

All of six volunteers inoculated with a filtered culture remained well.

CONCLUSION

Just as was shown by experiments reported in 1921 and 1923, that the scarlet fever streptococcus may cause sore throat without exanthem, it is now demonstrated that the hemolytic streptococcus found in erysipelas may cause acute anginas resembling ordinary sore throat or tonsillitis without the skin manifestations of erysipelas.

UNDIAGNOSED COUGH

A STUDY OF TWO HUNDRED PATIENTS *

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AND
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The present investigation was begun two years ago for the purpose of ascertaining whether an intensive study of a definite number of patients with chronic cough appearing for routine examination would not demonstrate active foci of tuberculosis in the guinea-pig when other methods, including examination of sputum, proved negative. The scope of this study entirely changed as the investigation proceeded, because we very soon became convinced, and so stated in our preliminary report [1] in January, that sputum negative to tubercle bacilli would never produce positive lesions in the guinea-pig even though the physical and roentgen-ray examination showed fibrotic areas, tracheobronchial or hilum involvement.

This report on 100 patients, in addition, proved to our satisfaction that we were dealing with two main groups in which there was chronic cough: (1) a 34 per cent group which we named acute bronchitis and asthma, whose main etiologic factor was a preceding attack of influenza; (2) a 32 per cent group in which we found, particularly on roentgen-ray examination, peribronchial and hilum thickening, enlarged bronchial root glands and various fibrotic areas in the lungs "which must be considered as undiagnosed." We have continued our investigation with these two main groups in mind, having now 200 patients selected from those reporting for routine examination at the Chest Clinic of Mount Zion Hospital and in private practice. All these patients had symptoms suggestive of pulmonary tuberculosis, such as persistent cough lasting form six weeks to several years, pain in the chest, hoarseness, loss of weight, weakness, night sweats and a history of hemoptysis of varying severity. In fact, many of the patients were referred with a diagnosis of definite tuberculosis, not a few coming from great distances to obtain a "change of climate."

Following the influenza epidemic of 1918, we saw many patients with pulmonary involvements wrongly diagnosed as tuberculosis. In 1919 Voorsanger [2] reported on some of these conditions, drawing conclusions which further study and experience have more than substantiated. They were principally that (1) nontuberculous pulmonary conditions must be recognized as diseases and (2) from 10 to 16 per cent of diagnosed pulmonary tuberculosis is not tuberculosis (records of admission to the Oaks Sanitarium, Los Gatos). Many observers and sanatoriums have reported similar conditions. In fact, a few years ago the name nontuberculosis crept into pulmonary nomenclature to include all chronic lung conditions that were not positively tuberculosis. Many patients who after negative physical examination show by roentgen ray, thickened pleura, inflammatory infiltrations in the lung parenchyma, interlobar thickenings, peribronchial or hilum thickenings and particularly basal involvements may or may not have tuberculosis. These patients must be placed in an insufficiently diagnosed group. However, by recognizing that they are potentially instead of positively tuberculous, much may be accomplished through correct living and proper therapy to forstall active tuberculosis.

The symptom which we studied especially was constant cough, considered chronic if it had persisted six weeks or more. All patients were submitted to a complete physical, roentgenologic and sputum examination. When tubercle bacilli were found, the patient was eliminated from the series. If tubercle tests of the sputum were negative, a culture was taken and a guinea-pig inoculated. As already stated, in no case in our series has the inoculation of the guinea-pig resulted in tuberculosis when tubercle bacilli could not be demonstrated by slide or culture. This has convinced us definitely that in the 200 patients whom we have investigated, symptoms were produced by conditions not due to active tuberculosis. What, then, are these conditions, and can they be relieved? The classification that is given in the accompanying table shows what we consider to be the underlying pathologic conditions causing cough.

Pathologic Conditions Causing Cough

	Number of Cases	
Enlarged bronchial root glands	23	8
With peribronchial and hilum thickening	49	23
With thickening of apical pleura	18	5
With basal thickening and density	16	4
Coarse mottling and fibrosis	21	10
Healed pulmonary fibrosis with calcification of glands	12	8
Emphysema bronchiectasis and asthma	10	12
Chronic bronchitis and pharyngitis	12	4
Sinusitis	7	4
Tonsillitis	2	2
Pleurisy with effusion	6	3
Mitral incompetence	6	4
Aortitis and aneurysm	2	2
Thyroid insufficiency	2	1
Hyperthyroid	2	1
Right pneumothorax (spontaneous)	1	1
Lung abscess	1	1
Bronchopneumonia with abscess	2	1
Malignancy	2	0
Neurasthenia and anemia	6	1
Total patients	200	100

In making this classification we carefully investigated 252 patients observed since 1922, eliminating fifty-two who showed tubercle bacilli in the sputum. In the second hundred patients we found two who had undoubtedly a malignant condition of the lung as a causative factor of cough. In another patient not yet classified whose diagnosis, in November, 1926, was "tuberculosis of the left lung" because of "a large area of increased density at the left top with irregular coarse mottling in the central portion of the lung," the condition has since been diagnosed as malignant. Sputum, culture and guinea-pig inoculation were negative (figs. 1 and 2).

* Read before the Section on Practice of Medicine at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 18, 1927.

1. Voorsanger, W. C., and Firestone, Fred: Etiological Factors in Chronic Cough: Preliminary Report, California & West. Med. **26**: 48 (Jan.) 1927.

2. Voorsanger, W. C.: Pulmonary Conditions Wrongly Diagnosed as Tuberculosis, California State J. Med. **17**: 238 (July) 1919.

Comparing the completed series of 200 patients with the original 100, we notice that our percentages have changed but little. Our undiagnosed group has risen to 38 per cent and our "infectious bronchitis and asthma" to 37 per cent. We realize that percentages cannot be exact since they may change as large numbers of patients are studied. However, we believe we have demonstrated conclusively that the main etiologic factors in chronic cough are (1) pulmonary infiltrations and thickening with or without enlarged root glands, most often following influenza and pneumonia and less seldom pleurisy with effusion; and (2) enlarged bronchial root glands and peribronchial thickening. To the first group we have given the name infectious bronchitis and asthma. In most of these patients the asthma and bronchitis followed from three weeks to two years after an attack of influenza or pneumonia. This group was treated with an autogenous vaccine made from three consecutive sputums. Passive immunity was usually produced as far as possible, and in many patients symptoms completely disappeared. We have previously reported the organisms found in this group with peribronchial involvement and clinical signs of asthma; i. e., *Micrococcus catarrhalis, Streptococcus nonhemolyticus, Streptococcus hemolyticus* alpha and beta, *Streptococcus viridans* and secondary invaders, such as gram-positive diplococci and staphylococci. In the sputum of one patient with signs of a severe upper respiratory infection, a pure culture of *Streptococcus viridans* was found which caused the death of the guinea-pig within twenty-four hours. He did not improve on a vaccine and still coughs. One patient (fig. 3) with one year's history of persistent asthmatic attacks and constant cough and a loss of 20 pounds (9 Kg.), was referred because of suspected tuberculosis. This patient made a brilliant recovery after three months of injections with an autogenous vaccine. It is now one and a half years since cessation of treatment, and he has pursued his vocation daily without recurrence of the attacks.

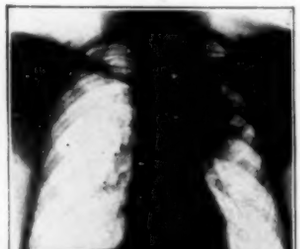

Fig. 1.—Tuberculosis of upper lobe of left lung in A. G., diagnosed, Nov. 15, 1926.

Fig. 2.—Gradual walling off of mass until definite diagnosis of a malignant condition could be made.

A patient (fig. 4), referred for pulmonary tuberculosis, suggested by a dull right apex and roentgen-ray picture of peribronchial thickening, complained of loss of weight, cough and severe asthmatic attacks. Iodized oil was introduced to exclude a bronchiectasis. No treatment availed with this patient except an autogenous vaccine. He is still under treament but has not had an attack in five months.

In another patient with a history of several years of cough and pulmonary hemorrhages, which were diagnosed as due to pulmonary tuberculosis, and for which he had been in three different sanatoriums for periods of from six months to a year, the sputum, culture and guinea-pig inoculation were negative. Figures 5 and 6 show bronchiectasis, especially after iodized oil.

We wish here to stress the value of iodized oil diagnostically since it has helped us with a number of patients either to substantiate or to rule out the diagnosis of bronchiectasis. It can be practiced harmlessly and with less distress than the method originally advocated by Forestier and Sicard [3] by using the "drop" method as recommended by Singer [4] of St. Louis. This consists in putting warmed iodized oil in a 20 cc. syringe, to which a straight cannula is attached. The tip of the cannula is placed above the root of the tongue and the soft palate without touching them. The oil is then allowed to enter drop by drop, the patient being directed not to swallow. Experience with this method, although limited, has given excellent diagnostic pictures.

The condition which we call "infectious bronchitis and asthma" has been variously named in recent years. McCrudden [5] calls it "postinfluenzal pneumonitis." Landolphi,[6] in a study of 3,580 patients in different epidemics, describes 106 with pleuropulmonary symptoms simulating tuberculosis and calls the condition pseudotuberculosis in influenza. Meader [7] speaks of "nontuberculous peribronchitis." Dorothy Atkinson,[8] in an extensive study, speaks of a "nontuberculous pulmonary fibrosis." In our opinion such names as pneumonitis, fibrosis, peribronchial thickening or peribronchititis refer to a pathologic condition chronic in nature, and are therefore inadequate to explain a symptomatology based on definite infections. Nor should the name pseudotuberculosis be employed, since in this way the condition may be confused with the true disease. We believe that the condition is a symptom and that therefore it should have a clinical rather than a pathologic name. It can easily be differentiated from the chronic disease bronchiectasis, into which it may develop if untreated. The roentgen ray (plus iodized oil when indicated) has been our main aid in differentiating these conditions from pulmonary tuberculosis. We have never swerved from our position that pulmonary fibrotic areas, particularly if basal with negative sputum and culture, could not be called tuberculous.

Our figures are not yet complete as to the exact number of "infectious asthma and bronchitis patients of this series who have been relieved entirely or partially of their symptoms by the use of an autogenous vaccine and who are symptom-free after two years." We believe at present that our records will show the latter group to be at least 10 per cent and will emphasize the value of the method. The prevailing organisms in the sputum of those patients yielding best to vaccine therapy were *Streptococcus viridans, Streptococcus nonhemolyticus* and *Streptococcus hemolyticus* alpha and beta uncontaminated as far as possible by other bacilli.

We now come to our second group, approximately 38 per cent of our series which must remain undiagnosed unless we accept as final the classification of enlarged bronchial root-glands, tracheobronchial tuberculosis and peribronchial thickening. Wessler and Jaches [9] stress errors made in diagnosing peribronchial and hilum

3. Sicard, J. A., and Forestier, J.: Methode générale d'exploration radiologique par l'huile iodée, Bull. et mém. Soc. méd. d. hôp. de Paris **46**: 463 (March 17) 1922.
4. Singer, J. J.: Simple Method of Introducing Iodized Oil into the Lungs, J. A. M. A. **87**: 1298 (Oct. 16) 1926.
5. McCrudden, F. H.: Postinfluenzal Chronic Pneumonitis, J. A. M. A. **80**: 609 (March 3) 1923.
6. Landolphi: Pleuropulmonary Symptoms and Pseudotuberculosis in Influenza, Reforma med. **40**: 1099, 1924.
7. Meader, C. N.: Nontuberculous Peribronchitis Simulating Occult Tuberculosis, J. A. M. A. **87**: 139 (July 17) 1926.
8. Atkinson, Dorothy, W.: Nontuberculous Pulmonary Fibroses, Am. J. M. Sc. **170**: 693 (Nov.) 1925.
9. Wessler, H., and Jaches, Leopold: Clinical Roentgenology of Diseases of the Chest, Troy, N. Y., Southworth Company, 1923.

tuberculosis, asserting that this is often based on misinterpretation of root shadows. These shadows are cast by structures such as blood vessels, bronchi and lymph nodes. An increase in the size of these shadows is not necessarily caused by tuberculosis. Any respiratory infection may cause inflammation of bronchial root-glands, engorgement of blood vessels, or enlargement of bronchi. A normal hilum, therefore, is practically unknown in an adult.

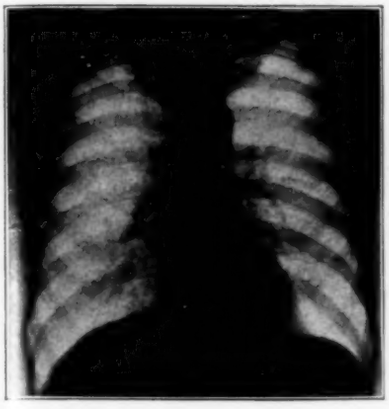

Fig. 3.—Heavy hilum shadows including thickening of bronchial markings in left upper and right lower lobes. Considerable dilatation of bronchi; diagnosis, nontuberculous inflammatory process following influenza; cough and asthma one year. Successful treatment with autogenous vaccine.

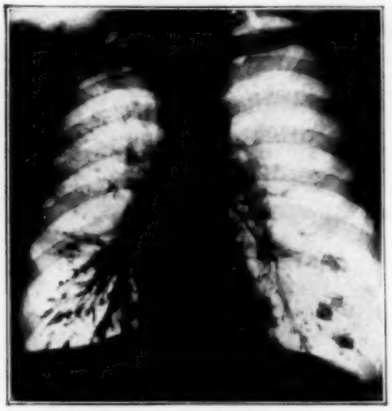

Fig. 4.—Definite thickening of both hila, particularly the left; remains of iodized oil after several weeks at left base. Diagnosis, bronchiectasis with asthmatic attacks.

It consequently behooves us to exercise care in differentiating inflammatory hilum conditions or peribronchial thickening from tuberculosis. When clinical evidence of tuberculosis does not exist, and when laboratory cultures are negative, a positive diagnosis should not be made roentgenologically unless tubercles are actually seen, and preferably in the lung parenchyma. Rist [10] insists that the roentgenograms must show a tubercle to make the diagnosis of tuberculosis positive.

We maintain that in our undiagnosed group, which includes peribronchial, hilum, pleural and basal thickening, the condition is potentially tuberculosis or bronchiectasis. By this statement we mean that clinically at the present time it is neither. The patients in this group were not selected. They came in the routine manner with symptoms of cough and expectoration extending over a long period of time, and they were placed in an undiagnosed group because organisms could not be found to account for the symptomatology. Their condition certainly cannot be called positive tuberculosis in view of absolutely negative cultures and negative results from guinea-pig inoculations.[11] However, when it is realized that all active tuberculosis, particularly in late adult life, has a history of years of coughing, is it not possible that a certain percentage of this undiagnosed group will become tuberculous, and is it not also possible by recognizing this eventuality to devise methods to prevent it? Evarts Graham [12] makes the charge that most of his patients operated on for bronchiectasis have been inmates of tuberculosis institutions under the diagnosis of pulmonary tuberculosis. This statement is undoubtedly true and shows a double error, first in diagnosing pulmonary tuberculosis from insufficient evidence, and second in not recognizing that if all bronchiectasis has a beginning in respiratory infections which cause inflammatory conditions in the hilum, and even for some distance into the lung fields, then an attempt should be made to check these conditions in their incipiency.

We have done much in the recognition of beginning pulmonary tuberculosis. Why can we not accomplish equally much in the early recognition of nontuberculous and inflammatory bronchitides? To do this requires segregation of the causes of respiratory symptoms such as we have outlined. Every patient with a chronic cough should be put through a definite procedure to ascertain if possible the organism responsible for his symptoms. We emphasize in this group as well as in the acute types the value of routine sputum culture and guinea-pig inoculation. Another diagnostic method of importance is the introduction of iodized oil after diagnostic pneumothorax. Figures 7 and 8 illustrate the value of such a method in attempting to diagnose a mediastinal mass roentgenologically when physical conditions are normal and there are no symptoms except persistent cough. We were able in this way to prove an inflammatory condition when a malignant one was strongly suspected.

Our two main groups therefore are 75 per cent of the total 200 patients studied, or 9 per cent more than in the first hundred. The remaining 25 per cent with chronic cough were placed under varying categories, as the table illustrates. When a definite pulmonary etiology could not be found, we took the main underlying pathologic condition and attributed the cough to it. Sinusitis is apparently the largest etiologic factor in the indiscriminate group and should always be borne in mind; all sinuses should be examined whenever chronic cough exists. Remarkable disappearance of cough has sometimes followed the treatment of an infected sinus.

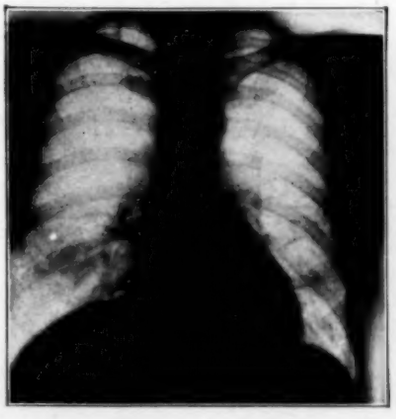

Fig. 5.—Enlarged bronchial root glands; marked thickening at right base. Note the clearness of the apexes.

Fig. 6.—After iodized injection; diagnosis, bronchiectasis.

10. Rist, Edouard: Am. Rev. Tuberc. **15**: 279, 294 (March) 1927.
11. Wankel: Inoculation of Guinea-Pigs with Sputum as a Means of Distinguishing Between Open and Closed Cases of Tuberculosis, Deutsche med. Wchnschr. **49**: 637 (May 18) 1923.
12. Singer, J. J., and Graham, E. A.: Roentgen-Ray Study of Bronchiectasis, Am. J. Roentgenol. **15**: 54 (Jan.) 1926.

CONCLUSIONS

1. Tuberculous lesions have not been demonstrated in guinea-pigs from inoculations of sputum free from tubercle bacilli as determined by the smear method.

2. Infectious bronchitis and asthma must be recognized as a disease since we found it in 37 per cent of our series. Its main etiologic factor is influenza.

3. The prevailing organisms found in the infectious group are *Micrococcus catarrhalis, Streptococcus nonhemolyticus, Streptococcus hemolyticus* alpha and beta, *Streptococcus viridans* and secondary invaders, such as gram-positive diplococci and staphylococci.

4. The infectious group is amenable to treatment with an autogenous vaccine, approximately 10 per cent of patients immunized having remained entirely free of symptoms after two years.

5. Thirty-eight per cent of our series with peribronchial and hilum thickening, enlarged bronchial root-glands or even fibrotic infiltrations in the lungs, particularly if basal, are in an undiagnosed group and must be given further study. Patients in this group must be considered as future subjects for either tuberculosis or bronchiectasis.

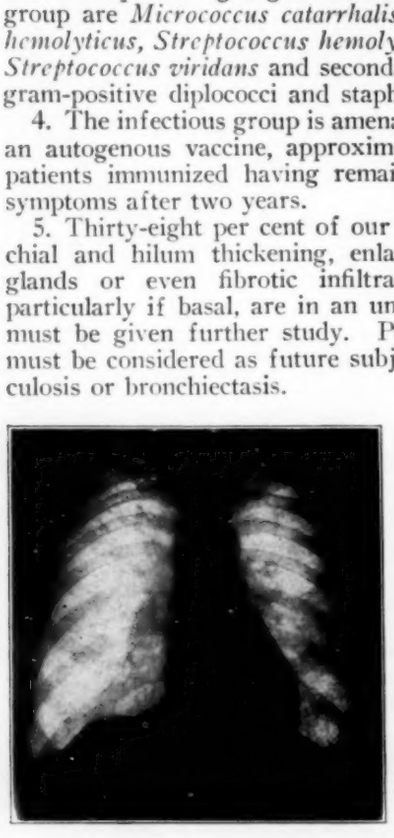

Fig. 7.—Marked enlargement of bronchial root glands, particularly right.

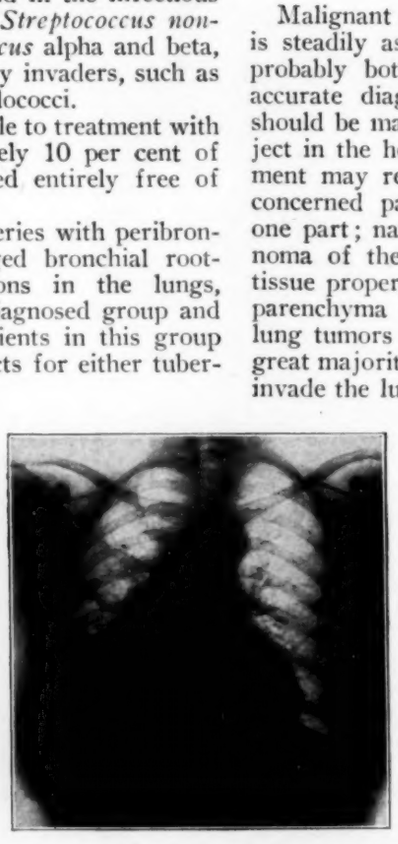

Fig. 8.—Inflammatory mass protruding from right hilum extending toward base. Thickening of interlobar space between lower and middle lobes. The patient complained of constant cough which had persisted more than one year, and a malignant condition was considered.

6. Careful physical and roentgen-ray examination and sputum culture is recommended in all patients with cough persisting more than six weeks.

7. Beginning bronchitides should be studied as carefully as beginning tuberculosis. Such measures as injection of iodized oil and diagnostic pneumothorax followed by roentgenograms are of inestimable value in differentiating various pulmonary nontuberculous conditions.

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Anatomic Traits Indicative of Native Constitution.—Other anatomical traits, such as the color or size of the eye, the profile of the face, or shape of the pelvis, are, like height, determined mainly by original nature. The growth of weight, while it shows a curve similar to that of height, except that it is more irregular, is more susceptible to environmental factors than is the development of most anatomical traits. An afternoon of violent exercise may reduce weight somewhat, without perceptibly affecting height. Malnutrition and most forms of illness have less effect on height than on weight. But here again, given a normal life, weight is largely an expression of native constitution; that is, if many children were given identical amounts and kinds of food, exercise and sleep, and were free from disease, they would still attain different weights.—Gates: Psychology for Students of Education, p. 112.

PRIMARY CARCINOMA OF THE BRONCHI *

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Malignant disease of the lung, including the bronchi, is steadily assuming greater importance as the result probably both of increased frequency and of more accurate diagnosis. It is important that the effort should be made to increase our knowledge of the subject in the hope that early diagnosis and proper treatment may reduce the mortality. This hope must be concerned particularly with neoplasms originating in one part; namely, in the bronchus. The term "carcinoma of the lung" suggests a neoplasm of the lung tissue proper, but new growths originating in the lung parenchyma comprise only a small proportion of all lung tumors (perhaps from 10 to 15 per cent). The great majority originate in the bronchi and subsequently invade the lung tissue.

It is therefore with neoplasms originating in the bronchi that we are particularly concerned. The main points that we shall discuss are (1) the question of increase in frequency; (2) the clinical picture; (3) the means of early diagnosis with particular emphasis on bronchoscopy, and (4) the treatment. We hope to show that an early diagnosis is possible in many instances, and that with early diagnosis there may be the chance of saving the patient, for in general these bronchial neoplasms appear to have a low degree of malignancy.

INCREASE IN FREQUENCY

The older statistics, which represent primary carcinoma of the lung as occurring in less than 1 per cent of all primary carcinomas, are apparently too low for the present. Recent statistics from Hamburg and Leipzig reveal at times an incidence as high as 9.4 and 15.5 per cent for primary carcinomas originating in the lungs. Kikuth [1] reports that in Hamburg pulmonary carcinoma ranks second, being one third as common as gastric carcinoma. Staehelin [2] of Basel reports a rate of 5 per cent from 1912 to 1924 as compared to 1.7 per cent before 1906, and Berblinger [3] of Jena, an incidence of 8.3 per cent in the period 1920 to 1924 as compared to 2.2 per cent in 1910 to 1914. There is no experience in this country which compares with these observations. Nevertheless an increasing number of reports suggest a greater relative frequency of primary lung cancer than has heretofore occurred. In the Jefferson Hospital during the last three years there have been 621 necropsies, with fifty-three instances of carcinoma, of which four have been primary in the lung. All of these have been considered as originating in the bronchi.

* Read before the Section on Practice of Medicine at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 18, 1927.

1. Kikuth, W.: Ueber Lungencarcinom, Virchows Arch. f. path. Anat. **255**: 107, 1925.
2. Staehelin, R.: Ueber die Zunahma des primären Lungenkrebses, Klin. Wchnschr. **4**: 1853 (Sept. 24) 1925.
3. Berblinger, W.: Die Zunahme des primären Lungenkrebses in den Jahren 1920-1924, Klin. Wchnschr. **4**: 913 (May 7) 1925.

The cause or causes of the increase in lung carcinoma have not been determined. The suggestion that the inhalation of particles of tar and the irritation of gasoline fumes play a part has to be seriously considered. The frequency of the antemortem diagnosis, in spite of the improvements of clinical methods, falls far below the postmortem frequency. We believe that with an increased clinical interest in a disease which is not uncommon more accurate diagnoses are possible. Adler's [4] monograph, which appeared in 1912, did much to stimulate the clinical interest.

BRONCHIAL ORIGIN

It will be a step toward a clearer clinical conception if the term bronchial carcinoma is more frequently used, reserving the term pulmonary carcinoma for those instances in which a bronchial tumor has been excluded by the most careful clinical and bronchoscopic study. That tumors have their origin in the pulmonary parenchyma is unquestioned, but Passler, in 1896, considered 87 per cent of lung carcinomas as of bronchial origin. Weller,[5] in 1913, was able to collect from the literature reports of ninety cases of primary carcinoma of the bronchi. Since 1913 we have collected 128 additional cases of lung cancer of bronchial origin. Combining these two series with our personal observation of fourteen cases in which the diagnosis was made clinically and verified by histologic study, we have analyzed certain clinical features, such as age and sex incidence, location of lesion, and frequency of certain symptoms.

Age and Sex.—The distribution at various ages is shown in figure 1. Approximately nine tenths (91 per cent) of the patients are past 35 years of age. Males seem to predominate in the proportion of four to one in the combined series. It is interesting to note that in Weller's series there were seventy males and seventeen females among eighty-seven patients; in our collected series, ninety-six males and twenty-two females, and in our patients, ten males and four females.

Location.—Among 187 collected cases, including our own, in which it was possible to determine the location of the tumor, it was found that the right side was involved in seventy-four instances (40 per cent); the left side in eighty-nine instances (47 per cent), and both sides (frequently at or so near the bifurcation as to be undeterminable) in seventeen (9 per cent). In seven instances (4 per cent) it was not possible to state the site of involvement.

CLINICAL FEATURES

The clinical picture varies greatly, depending on the rapidity of growth, the degree of ulceration and obstruction, the pressure on adjacent structures, the occurrence of hemorrhage, effusion, infection and abscess formation, and local and general metastases.

The onset is usually insidious but may be sudden with a pulmonary hemorrhage, pain in the chest, or symptoms resembling an acute bronchitis. While the early symptoms are usually bronchial, these are sometimes obscured by the symptoms of metastases in the nervous system, abdomen or bones. Local symptoms were present in all our fourteen patients as follows: Cough in fourteen instances; expectoration in twelve; hemorrhage in eight; dyspnea in eight, and pain in the chest in eleven. These are the usual local symptoms, and in ninety of the 128 collected cases in which it was possible to analyze the local symptoms, cough was present in all (100 per cent); expectoration in eighty (89 per cent); hemoptysis in fifty-two (58 per cent); dyspnea in fifty-six (62 per cent), and pain in the chest in seventy-three (81 per cent). In thirty-eight of the 128 collected cases, local symptoms were either absent or so briefly described that it was not possible to analyze them.

The cough does not present characteristic features. It usually occurs early and may be continuous, but is not infrequently characterized by periods of improvement and aggravation which the patient describes as attacks of bronchitis. In some instances it is very severe and interferes with sleep. Wheezing is a frequent accompaniment. In the later stages, with extension of the growth and pressure on surrounding structures, it may resemble the cough of aortic aneurysm. In one instance among our patients there was definite involvement of the recurrent laryngeal nerve with hoarseness.

The expectoration varies in occurrence and in amount. It may be absent early in the course of the disease. When present it varies from a scant mucoid or mucopurulent discharge to a profuse mucopurulent, fetid sputum. The latter is usually associated with secondary abscess formation. The "currant jelly sputum," which is said to be characteristic, is rarely encountered. Careful search of the sputum has in some instances revealed fragments of tumor tissue. Tubercle bacilli are absent except in those very rare instances in which tuberculosis and cancer have occurred together. The absence of tubercle bacilli is of considerable importance in excluding tuberculosis, the disease for which cancer of the bronchus is most frequently mistaken.

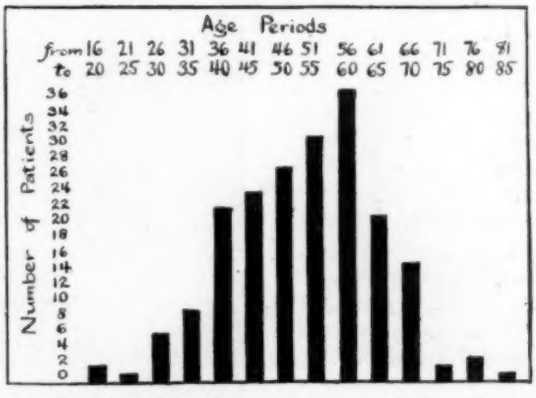

Fig. 1.—Age incidence in primary carcinoma of the bronchi among 202 patients, including those reported in the literature and the authors' cases.

Hemoptysis is a frequent and important symptom. It usually appears early in the course, and varies in amount from streaking of the sputum to a frank hemorrhage. In some patients the frequent recurrence of the bleeding produces a secondary anemia. A large fatal hemorrhage is rare. The hemorrhagic features were pronounced in the following case previously reported by Jackson and others: [6]

M. H., a woman, aged 24, admitted, Jan. 13, 1924, complained of a chronic productive cough with recurring severe pulmonary hemorrhages and pain in the lower right chest. The onset

4. Adler, I.: Primary Malignant Growths of the Lung and Bronchi, New York, Longmans, Green & Co., 1912.
5. Weller, C. V.: Primary Carcinoma of the Larger Bronchi, Arch. Int. Med. **11**: 314 (March) 1913.
6. Jackson, Chevalier; Tucker, Gabriel; Clerf, L. H.; Lukens, R. M., and Moore, W. F.: Bronchoscopy as an Aid to the Thoracic Surgeon, J. A. M. A. **84**: 97 (Jan. 10) 1925.

was dated from an acute bronchitis in 1920, at which time there were cough, expectoration, blood spitting and pain in the lower right chest which lasted several weeks. Between the onset and the time of admission there were many attacks similar to that which characterized the onset, and in the intervals a chronic cough. In the spring and fall of 1923, the pulmonary hemorrhages were severe. For three years the patient was considered to have tuberculosis, although the sputum was negative for tubercle bacilli. At the time of admission and shortly afterward there were severe pulmonary hemorrhages resulting in a marked secondary anemia. Examination showed a pulmonary lesion involving the lower two thirds of the right lung. The roentgen ray revealed a shadow at the right base. A diagnosis of nontuberculous pulmonary disease was made and bronchoscopy was advised (fig. 2). A section of bronchoscopically removed tissue showed adenocarcinoma. Direct blood transfusions for the anemia and roentgen-ray therapy for the malignant growth resulted in a surprising improvement in the patient, who at present (three years later) continues in good health.

Dyspnea is common, and the patient frequently describes the early respiratory discomfort as a wheezing with shortness of breath on exertion. It is quite marked in those instances in which there is bronchial occlusion, and, once established, tends to become progressively worse. A complicating pleural effusion, such as occurred in two of our patients, may add to the respiratory distress.

Pain in the chest was a frequent symptom in our patients, occurring in eleven of the thirteen. In three instances it was associated with an acute pleurisy which in one was followed by a serohemorrhagic effusion and in another by an empyema. In other patients the pain was variously located, and described as either sharp or dull and aching, intermittent or continuous, and tending to become worse as the disease progressed.

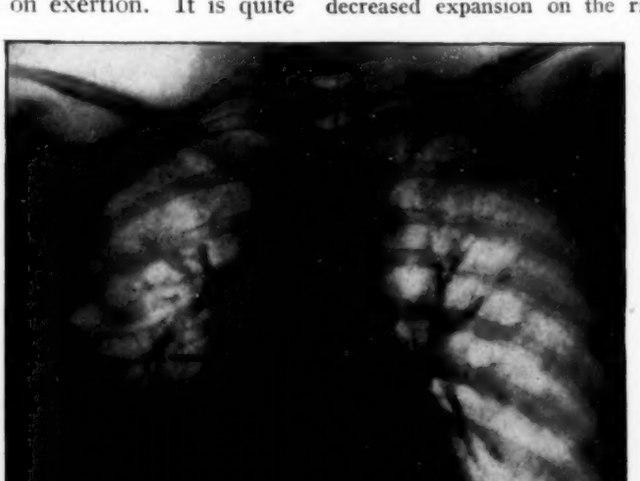

Fig. 2.—Pneumonograph of M. H. showing obstruction (The Journal, Jan. 10, 1925, p. 99). The concave end of the shadow of the bronchoscopically insufflated bismuth indicated by the dart shows where the bismuth fitted over the cancerous nodule. A removed specimen showed adenocarcinoma.

Physical Signs.—It is evident that no single picture of these can be given any more than in the case of foreign bodies in the bronchi. In general the early signs are those of bronchial obstruction, which may be slight or marked. The evident tendency is for the obstruction to increase, and hence the signs become more pronounced. There will be decreased expansion with any degree of obstruction. Vocal fremitus is likely to be decreased. The percussion note will vary, especially with any collapse, but usually shows dulness, and if there is complete obstruction there will be flatness. As in the case of foreign bodies, the signs may change from day to day if the degree of obstruction varies. Today breath sounds may be absent over a lobe and the next day can be heard, perhaps with râles. This change in a short time should always suggest bronchial obstruction. With marked dulness, fluid may be suspected; but if the area corresponds to a lobe, the dulness does not shift and any displacement of the heart is likely to be to the affected side. The use of the needle should remove any doubt. The occurrence of pleural effusion complicates the picture, as does abscess formation peripheral to the new growth.

It is important to realize that there is nothing specific in the physical signs, and as we are concerned especially with new growths in the bronchi, the signs of obstruction are important. Evidently when the growth extends to the lung or involves the glands there will be variations in the signs dependent on the extent and situation of the extension of the growth. The account of several cases gives the physical signs as well as any set description.

E. R., a woman, aged 31, complained of cough and weakness. The family and past history were negative. The present illness began less than four months before with cough, which gradually became more severe. There was very little expectoration. After two months the cough was very severe, and she noted increasing weakness. At times there was wheezing. At the time of admission there was marked shortness of breath. With rest, the cough decreased. Examination showed decreased expansion on the right side, most marked below, with decreased vocal fremitus and marked dulness over the middle and lower right lobe. The breath sounds were diminished but not entirely absent over this area, and there were occasional râles. The heart was not displaced. The roentgen-ray study showed a shadow corresponding to the middle and lower lobes. Bronchoscopy was done by Dr. Jackson, and showed involvement of the right main bronchus just below the orifice of the upper lobe bronchus. The whole bronchial wall was infiltrated by a new growth which almost closed the lumen. Very little secretion was seen and the mucosa was not ulcerated.

The following case illustrates the physical conditions with typical bronchial obstruction:

H. F., a man, aged 60, was admitted, Oct. 13, 1924, with distressing nonproductive cough, weakness, shortness of breath, moderate cyanosis and fever. The onset had been three months before admission with pain over the lower right chest and back. Shortly after the onset the cough became quite distressing and dyspnea was marked. A diagnosis of pleural effusion was made but two tappings were unsuccessful. Examination revealed the trachea displaced toward the right, distinct immobility of the right chest, dulness over the entire right lung, front and back, with suppression of the breath sounds, and decreased transmission of the voice sounds. The heart was displaced toward the right. The roentgenogram revealed a dense shadow throughout the right lung and the displacement of the trachea and heart with fixation of the right diaphragm. The blood count showed hemoglobin, 78 per cent; red blood cells, 4,100,000, and white blood cells, 11,700. Since foreign body inhalation was considered unlikely from the history and age of the patient, the cause was assumed to be a new growth.

Bronchoscopy revealed occlusion of the right main stem bronchus with a mass, a section of which was removed and found to be carcinoma.

The general features are weakness, loss of weight and fever, but early in the course they are slight and their absence for some time may be misleading as to the seriousness of the local disease. Later their general character suggests tuberculosis, which disease has been most frequently diagnosed in pulmonary cancer.

There has been considerable discussion regarding the occurrence of fever. Weller states that it was mentioned in only four of his collected series of ninety cases, and Grove and Kramer state that the continued absence of fever in three cases was of diagnostic importance. In the cases reported since Weller's article, it is said to be present about as often as it is said to be absent. In our own series of fourteen patients, it was present in eight instances while under observation. Its presence is dependent largely on the presence of associated infection. This is strikingly illustrated in one of our patients who, because of cough, purulent expectoration, and septic temperature, was referred with a diagnosis of pulmonary abscess. That infection is not uncommon in bronchial carcinoma is evident from the bacterial reports of endoscopically removed secretions from the tumor area.

The blood examination may show a normal count or varying grades of anemia and leukocytosis. Hemorrhage and infection are important factors in determining the blood picture.

Extrathoracic Metastases.—It is our experience that bronchial carcinoma metastasizes late in its course. Fried[7] believes that metastases occur early and not infrequently obscure the symptoms and signs referable to the chest. In our series of 128 collected cases with sufficiently complete clinical and autopsy notes, it was found that extrathoracic metastases were recognized ante mortem in thirty-nine instances and post mortem in eighty-five instances. Although the bones and nervous system are said to be frequently involved, the nature of some of the metastases, e. g., to the suprarenals, kidneys and other organs, may be clinically obscure. From the recorded experience it appears that metastases outside the chest are recognized clinically in about one third of the cases before death, although present in about two thirds of the cases at death. The importance of these extrathoracic metastases, especially in the cervical nodes and brain, is emphasized by two cases in our group:

L. M., a man, aged 43, was admitted, March 6, 1927, complaining of cough, slight mucopurulent expectoration, pain in the right chest, and headache. The onset dated from an attack of pleurisy in January, 1927. Physical examination revealed two small nodules above the inner end of the right clavicle, and signs of a marked lesion in the left lung, especially in the middle and lower portions. The roentgen-ray examination confirmed these observations. One of the supraclavicular nodes was removed and histologic study showed carcinoma. Death occurred some weeks later, and a necropsy revealed primary carcinoma of the lung originating from the left main stem bronchus, and extending into the lung with secondary abscess formation. Metastases were limited to the thoracic organs and cervical nodes.

H. T., a woman, aged 37, admitted, Jan. 5, 1926, complained of loss of power in the right arm and right leg, shortness of breath and cough, and nausea and vomiting. The onset had occurred three months before admission with a "cold in the chest," followed by serous effusion, which was tapped. The dyspnea increased in spite of repeated tappings, and about one month after the onset transient twitchings of the right arm occurred followed by loss of power in the right arm and right leg. The clinical evidence pointed to a primary carcinoma of the lung with cerebral metastases. Because of the serious condition of the patient, a bronchoscopy was not done. Necropsy revealed a primary carcinoma of the right bronchus invading the adjoining tissue, with metastasis to the left frontal and left parietal regions of the brain, the liver, the suprarenals and the abdominal lymph nodes. This case has been reported in detail by McCrae.[8]

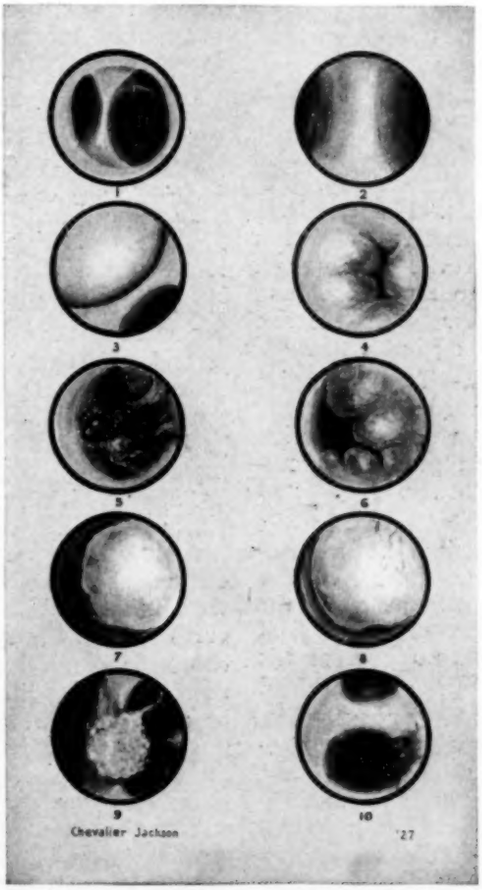

Fig. 3.—Bronchoscopic views of neoplastic diseases.

DIAGNOSIS

As with so many other difficult problems in diagnosis, it is essential to think of the possibility of new growth. A study of the failures of diagnosis of the presence of a foreign body in a bronchus carries the same lessons as in this problem. As long as we think only of the changes in the lung supplied by an obstructive bronchus and are satisfied with diagnosing these, correctly or incorrectly, without the attempt to go farther back in the course of events, we shall fail to recognize bronchial obstruction. There are several general points worthy of note: 1. The condition is a chronic one and the diagnosis does not have to be made at once. 2. The signs are not suggestive of change in the lung or pleura alone. 3. The signs may change from day to day, especially on auscultation. This is important, especially as regards râles. The amount of secretion is usually not great but it may change, depending on the degree of obstruction. The variability of the breath sounds and the presence of râles is very suggestive. With the occurrence of abscess or bronchiectasis beyond the new growth, a great variety of signs may be found. It is evident that except by bronchoscopy a complete diagnosis is not probable unless the roentgen-ray study is definite. With well marked abscess formation the diagnosis may be most difficult, as in a patient whom we saw in the surgical service. At operation a large quantity of fetid pus was evacuated. A section of tissue removed at this time showed carci-

7. Fried, B. M.: Primary Carcinoma of the Lungs, Arch. Int. Med. **35**: 1 (Jan.) 1925.

8. McCrae, Thomas: M. Clin. N. Amer. **10**: 1 (July) 1926.

noma. Bronchoscopy was not necessary at this late stage for the diagnosis, and at subsequent necropsy a bronchial carcinoma with extension into the lung with secondary abscess formation was found. The patient had been ill for ten months before admission, during which time a positive diagnosis with bronchoscopy could have been made.

The method of diagnosis that is most certain and should always be employed is bronchoscopy. By it the area can be seen, and if necessary a portion of tissue can usually be removed. The value of direct inspection of any lesion does not need emphasis. Who thinks of speculating as to the nature of a lesion in the bladder when it can be seen through the cystoscope? Why not the same with the bronchi? Too often the need of bronchoscopic examination is not realized.

There are certain conditions that cause confusion, but a careful study should exclude them in a majority of cases.

1. *Tuberculosis.*—It is natural that a chronic lung condition should be regarded as tuberculosis. Involvement of the middle or lower lobes with the apexes clear is very strong evidence against tuberculosis. Repeated negative sputum examinations point the same way. The absence of fever is against tuberculosis. If hemorrhage has occurred from a new growth, a hasty conclusion in favor of tuberculosis may never be revised. The good rule that a persistent extensive process in the lung which is tuberculous almost always gives tubercle bacilli in the sputum is a safeguard against error.

2. *Foreign Body in a Bronchus.*—This may give exactly the same signs and symptoms as a new growth, and in the absence of a clear history, unless the foreign body is opaque and shows in the roentgenogram, nothing but bronchoscopy can give the answer.

3. *Abscess.*—This may give difficulty, as in the patient previously referred to, especially if it is extensive and involves a large portion of the lobe. The difficulty is evident if the new growth obstructs the bronchus completely, causing an absence of purulent expectoration. Here, again, bronchoscopy gives the answer.

4. *Pressure on a Bronchus from Without.*—The cases of aneurysm should not give difficulty if a careful study is made, but in a rare case in which the roentgen-ray study does not show the aneurysm, it may be difficult to decide. Pressure from enlarged mediastinal nodes, or from new growths beginning in the lung parenchyma, will give difficulty, but a bronchoscopic examination shows at once that the pressure is from outside the bronchus.

5. *Changes Peripheral to the New Growth.*—It is evident that these may so dominate the picture that the condition in the bronchus is not recognized. Bronchiectasis and gangrene may act in the same way as abscess. Again, bronchoscopy is of the greatest value. Reference has been made to those cases in the literature in which terminal metastases have obscured the clinical picture. A careful history often reveals the initial symptoms referable to the respiratory tract.

6. *Cancer of the Trachea.*—This condition may give rise to symptoms not unlike those in bronchial involvement. Only by bronchoscopy can differentiation be made in these cases.

In eleven of our fourteen patients, the positive diagnosis of bronchial carcinoma was made by bronchoscopic examination. In nine of these it was verified by histologic study of removed sections of tissue. In two the changes were so typical that Dr. Jackson preferred not to remove a section of tissue. In three of the fourteen patients bronchoscopy was not done because in two metastases were present and in one a large abscess required surgical drainage. At operation, a section of tissue was removed and shown to be carcinoma.

PROGNOSIS

With early diagnosis, the prognosis may not be so hopeless as is generally considered. The patient, M. H., whose clinical notes have been given, is apparently well three years after intensive roentgen-ray therapy. Another patient has continued well for two years under periodic roentgen-ray treatment. We are not prepared to state the ultimate outcome in these patients. Most of the other patients have died, or have been under observation for too short a period of time to permit much stress on their improvement under roentgen-ray therapy. The ultimate hope is either in thoracic surgery, which has made important progress in recent years, or in such an early diagnosis that endoscopic removal is possible, as in the case reported by Jackson [9] in 1917. In this patient an endobronchial neoplasm producing obstruction was removed by peroral endoscopy and the patient is well today—eleven years later. At the time, Jackson said: "As this is the only recorded case of apparent cure of an endothelial endobronchial tumor by peroral bronchoscopy, and only the second endoscopic removal of any form of malignant growth from a bronchus, it would be unwise to make too many or too sweeping deductions." Since Jackson's observations, Orton [10] reported the endoscopic removal of a pedunculated growth from the bronchus which was diagnosed histologically as carcinoma by Ewing. The symptoms cleared following the removal of the neoplasm, and four years have elapsed since the removal and the patient continues well. As stated by Jackson [11] recently, "A number of cures of endobronchial growths have followed bronchoscopic removal by different bronchoscopists. The number of cases in which this should be attempted will be relatively few. Success could be possible only in the earliest stages of the disease; but these cases are of the utmost importance as clinical evidence of the relatively mild degree of malignancy and of the slowly metastasizing character of endobronchial carcinoma and endothelioma. The bronchoscope will contribute to the cure more often as a means of early diagnosis than as a means of removal."

THE BRONCHOSCOPIC DIAGNOSIS OF NEOPLASTIC DISEASES [12]

In order to recognize a neoplastic condition with the bronchoscope, the microscope or with the naked eye, it is essential to have the perceptive faculties thoroughly trained to the normal images presented by the tissues to be diagnostically examined. For bronchoscopic diagnosis it is essential that the eye be so thoroughly trained to the (*a*) color, (*b*) form and (*c*) movement of the bronchi in health that any departure from the normal is at once apparent. It would be a platitude to say

9. Jackson, Chevalier: Endothelioma of the Right Bronchus Removed by Peroral Bronchoscopy, Am. J. M. Sc. **153**: 37 (March) 1917.
10. Orton, H. B.: Bronchoscopic Clinic, S. Clin. N. Amer. **6**: 1529 (Nov.) 1926.
11. Jackson, Chevalier: Bronchoscopy, in Sajous: Cyclopedia of Practical Medicine, 1927.
12. Comments by Dr. Chevalier Jackson.

that the histopathologist must know the normal microscopic appearances; yet only too often the parallel fact about the bronchoscopic appearances is not realized. The bronchoscopist as compared to the microscopist has an additional diagnostic factor to study; namely, movement. This is of the utmost importance in bronchoscopic diagnosis.

Color.—The whitish pink of the normal mucosa of the bronchi, as seen bronchoscopically under proper illumination, is similar to that of the mucosa on the inside of the cheek as seen by electric light, and is subject to the same range of color within the limits of health, as modified by slight congestion or anemia and by individual variations. Vessels are not usually conspicuous in the normal mucosa but can be seen in certain locations, especially where the mucosa is intimately associated with the perichondrium. The color of neoplasms may be the same as that of the normal mucosa, in which case the bronchoscopic diagnosis is made on alterations in form and movement. A neoplasm covered with musoca of normal color may be streaked with enlarged, branching, usually tortuous blood vessels. On the other hand, the color of a neoplasm may be quite distinctive, white, yellow, red, purple, or various shades of these colors. Color may be modified by the tinting film of overlying blood and secretions. It may

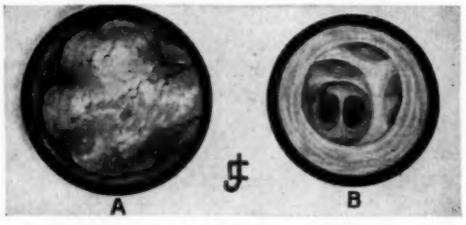

Fig. 4.—Endobronchial obstructing endothelial tumor in a man, aged 35, who complained of coughing, wheezing and "a sensation as of a ball-valve shutting off the breath, sometimes on inspiration and at other times on expiration." *B*, bronchoscopic view down right main bronchus. *A*, tumor presenting itself in its self-made bronchial enlargement, when the bronchoscopic tube-mouth reached the location at which the view *B* should appear. The tumor was removed with forceps through a bronchoscope passed through the mouth. The patient was free from symptoms at the end of three weeks and remained perfectly well ten years later.

be modified also by the degree of illumination unless proper care is taken always to have this the same.

Form.—The most often diagnostically useful departure from normal is in the form of the presenting images. The thin, white spurs between branch bronchi, the oval or circular orifices, the circular walls, are all so beautiful and so perfect that any departure from normal is instantly apparent. Tumors may distort these normal forms, or a tumor mass in a bronchial lumen may partially or completely hide these normal structures.

Figure 3 presents bronchoscopic views of neoplastic diseases.

1. Bronchoscopic view as seen in a recumbent normal person, when the tube mouth is a few centimeters proximal to the bifurcation of the trachea. The carina is seen as normally thin, sharp and whitish, and it is located a little to the left of the median line. The left bronchial orifice appears somewhat as a crescent; the right bronchus, which is anatomically the continuation of the trachea, is seen extending into the depths of the right lung. Anteriorly a small portion of the middle lobe bronchus is visible. In addition to normal form and color, normal movements, beautiful, wavy, flexible, rhythmic respiratory and more abrupt pulsatory movements are noted in the normal. It is of the utmost importance that these normal appearances be studied.

2. Broad carina in a man, aged 48, indicating infiltration of the glands beneath the bifurcation (compare with 1). The glands might have been inflammatory, tuberculous or malignant, but the accompanying fixation, rigidity and other evidences of infiltration warranted a diagnosis of cancerous metastases, which was confirmed by the bronchoscopic finding of a malignant lesion in the right bronchus.

3. Deformity and displacement of the carina backward to the right by a large cancerous infiltration, not yet ulcerative, which occludes the left bronchial orifice.

4. Cancerous nodules occluding the right main bronchus in a man, aged 48. The erroneous diagnosis of asthma had been made prior to the patient's coming under the care of Dr. E. H. Funk, who suspected cancer and requested a diagnostic bronchoscopy.

5. Fungating carcinoma of the trachea with a scabbard-shaped lumen due to metastatic infiltration. Histologic examination of a bronchoscopically removed specimen showed the growth to be a carcinoma. The patient, a woman, aged 48, had been treated for more than a year for asthma because of paroxysmal coughing and wheezing.

6. Cancerous nodules in the right bronchus of a man, aged 42. The bronchoscopic diagnosis was confirmed by the histologic report of adenocarcinoma made on a bronchoscopically removed specimen.

7. Bronchoscopic view of an endobronchial carcinoma diagnosed bronchoscopically, and verified histologically by an examination of a specimen removed through the bronchoscope. Exsanguinating hemorrhages ceased after bronchoscopic insufflation of bismuth subcarbonate. Deep roentgen-ray therapy arrested progress of the growth. The patient is in good general condition after four years. Prior to admission the patient was erroneously supposed to have tuberculosis.

8. Bronchoscopic appearances of an endobronchial carcinoma in a woman, aged 38. Histologic examination of a bronchoscopically removed specimen verified the bronchoscopic diagnosis. The surgeon deemed the growth and metastases inoperable. Deep roentgen-ray therapy arrested the progress of the growth, which has remained stationary for four years.

9. Fibropapilloma with a long slender pedicle attached to the wall of the right bronchus below the level of the right upper lobe bronchus, discovered at diagnostic bronchoscopy, in a woman, aged 44. The symptoms of paroxysmal coughing, wheezing and bubbling mucopurulent secretion led to an erroneous diagnosis of asthma. The bronchoscopic diagnosis was confirmed by biopsy. Cure of the symptoms followed peroral bronchoscopic removal. The patient was free from recurrence two years later.

10. The fungations seen at the right side of the lower-lobe bronchial orifice might be either exuberant granulations or malignant fungations. The bronchoscopic diagnosis of cancer was based on the thickened infiltrated spur between the lower and middle lobe bronchial orifices. The latter is uppermost in the illustration. The diagnosis of cancer was verified by histologic examination of a specimen removed at diagnostic bronchoscopy.

Endobronchial tumor intrusions may be nodular or fungating; sessile or pedunculated. Nodular growths may be in the form of a single smooth nodule, multiple nodules, or a nodular surfaced single mass. Nodular growths must be distinguished not only as to malign or benign neoplasms but also as to granulomas, tuberculomas, syphilomas and edematous polypi secondary to suppuration. Fungations must be distinguished from granulations. The distinction by bronchoscopic appearances will usually be correct, but confirmation by biopsy is usually advisable, especially if external surgery for a malignant growth is contemplated. For deep roentgen-ray therapy, the diagnosis by bronchoscopic appearances alone is usually sufficient. Longitudinal ridging of the mucosa is sometimes seen proximally to an endobronchial cancer. The ridges are especially conspicuous when the bottom of the intervening creases is filled with blood. In these lesions showing proximal ridging, and in most other cases of endobronchial can-

cer, the bronchial rings are obliterated. Broadening of the carina as seen bronchoscopically is constantly associated with adenopathy. If there is an endobronchial apparently malignant lesion it is a warranted inference that the glandular mass is metastatic, though it may possibly be inflammatory consecutive to the suppuration complicating the malignant lesion. The most common cause of adenopathy at the bifurcation is, of course, tuberculosis. In one of our patients with a very broad carina, the carcinomatous metastases were implanted on an old tuberculous adenopathy. Deviation of any portion of the bronchial tree, if associated with distortion of luminal outlines, fixity and the firmness denoting infiltration, is strongly suggestive of peribronchial neoplasm; and especially so if a peribronchial mass can be felt with the bronchoscope on the side from which the deflection occurs. A later bronchoscopy in such patients will usually reveal invasion of the bronchial wall if the process is malignant. The appearances

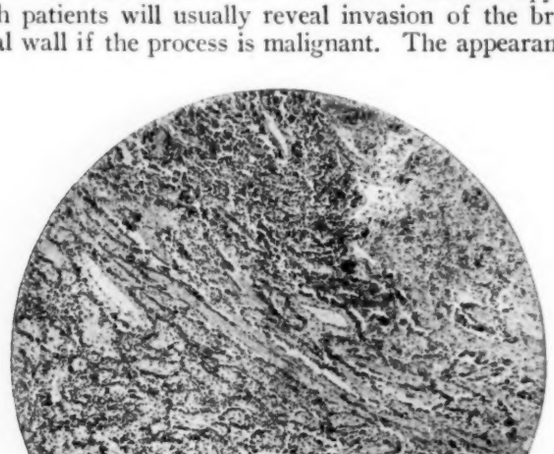

Fig. 5.—From a photomicrograph showing carcinomatous histologic structure in a bronchoscopically removed specimen, confirming a bronchoscopic diagnosis of cancer of the lung in a woman, aged 38, supposed to be tuberculous. Histologic diagnosis by Dr. Baxter L. Crawford.

then will be conclusive, and the diagnosis can be safely confirmed by biopsy if desired.

Fixity.—Cadaveric studies have resulted in an erroneous impression as to the living tracheobronchial tree. In health it is not a rigid series of tubes; on the contrary, it is a resilient, collapsible, easily displaceable structure. The bronchi expand, contract, elongate and shorten, and they are rhythmically deflected in the normal respiratory cycle. At the same time they are subject to dinging, kinking, and deflection by the transmitted pulsatory movements. To the eye trained to this normal resilience and movement the fixity that comes with infiltrative disease is quite evident. Fibrosis following inflammatory conditions may markedly lessen the normal resilience, but it does not convey to the bronchoscopist the same impression of rigidity that is associated with cancer. The most striking manifestation of fixity is immobility of the carina. To any one who is familiar with the normal respiratory anterior rise and posterior fall of the carina, fixity is at once apparent.

Pulsatory movements, being transmitted, may not be quite so obviously interfered with by infiltration unless massive; but the absence of the rhythmic indentation of the thin normal wall of the trachea and the larger bronchi synchronous with the heart beats is at once apparent. Fixity is not always neoplastic, but the fixity due to cancer and cancerous metastases is more marked and more rigid than that due to inflammatory or tuberculous adenopathy or to fibrotic conditions. In cancer of the lung there is in the involved area an absence of inspiratory expansion and elongation, of expiratory contraction and shortening, of kinking and deflection, that to the experienced observer is diagnostic. The bronchoscopic appearances of this absence of movement can be described in a general way as "wooden."

Bronchoscopic removal of a specimen of tissue is always practicable when the bronchial mucosa is involved. In the cases of a primarily endobronchial lesion, a small specimen of the nodular or fungating mass will suffice to show the nature of the process. In peribronchial probably malignant disease, no matter how characteristic the deflection and deformity of the bronchial lumen, it has seemed unwise to bite through normal mucosa in an effort to obtain neoplastic tissue. Future investigations may show us to be too conservative, but we feel that it is due to following this rule that we have not had any ill result from the removal of a specimen of tissue in any case. For obvious reasons, aneurysm should always be excluded by every possible diagnostic means. Usually pulmonary tuberculosis and active syphilis are also contraindications; at least their presence should be known beforehand. Obviously, their presence does not necessarily exclude an associated malignant lesion. In rare instances the taking of a specimen of tissue may be indicated in a patient with a positive Wassermann reaction or in one with tubercle bacilli in the sputum.

TREATMENT

Only in a very rare case is removal possible by the bronchoscope. Our main dependence must be on intensive roentgen-ray therapy, the details of the administration of this depending on the judgment of the roentgenologist. With greater perfection in lung surgery, it is not too much to hope that removal of the lobe concerned may be possible. In any case, early diagnosis is essential.

CONCLUSIONS

1. The evidence suggests that carcinoma of the lung, which in the great majority of cases originates in a bronchus, is increasing in frequency.

2. These bronchial tumors appear to have a relatively low malignancy, and hence the hope that early diagnosis and intensive roentgen-ray therapy may be effectual in at least prolonging life.

3. Early diagnosis should be made if the possibility of bronchial neoplasm is considered and careful studies are made. The early symptoms are usually those of bronchial irritation and the early signs those of bronchial obstruction.

4. By bronchoscopy a positive diagnosis can almost always be made promptly and proper treatment instituted.

5. Patients who present obscure pulmonary and bronchial symptoms have a right to the benefit to be derived from bronchoscopy.

1929 Spruce Street—1318 Spruce Street—128 South Tenth Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. VOORSANGER AND FIRESTONE, AND DRS. MCCRAE, FUNK AND JACKSON

DR. HUGH J. MORGAN, Nashville, Tenn.: Additional knowledge concerning atypical, chronic respiratory infections is desirable. The authors' infectious bronchitis and asthma group seems to include (1) nontuberculous pulmonary infection (Hamman and Wolman, 1917) and (2) so-called asthmatic bronchitis. It seems desirable that we continue to differentiate between these fairly distinct clinical entities. In the enumeration of the organisms found in the infectious bronchitis and asthma group, no mention is made of the occurrence of *B. influenzae*. When carefully searched for, this organism will be found in a surprisingly large percentage of the chronic nontuberculous pulmonary infections, as was pointed out by Lord, Hamman and Wolman, Miller, Avery, Garvin and others, several years ago. In spite of the experience of the authors of this paper, I do not feel that one is justified in assuming that the guinea-pig method of demonstrating tubercle bacilli in sputum will never succeed, in the absence of readily demonstrable bacilli in the sputum when examined by the usual microscopic method. The reliability of the latter method is no more or no less than that of the examiner employing it. One is hardly justified in assuming that a given symptom or set of symptoms is not dependent on active pulmonary tuberculosis solely because tubercle bacilli are not demonstrable in the sputum. Although a very large percentage of active pulmonary tuberculosis is "open"—that is, the lesion is in communication with the bronchial tree—we know that "closed" active tuberculosis occurs. I am sure that many patients with active pulmonary tuberculosis have been deprived of treatment because of the ancient dictum that "tubercle bacilli must be demonstrable in the sputum if the lesion is active." I wish to emphasize also that in a given case the demonstration of bronchiectasis in no way excludes the possibility of the presence of tuberculosis. Bronchiectasis often develops in a tuberculous lung. The importance of the prophylactic treatment of bronchiectasis developing on the basis of chronic pulmonary infection is well stressed in this paper. The authors' results with vaccine treatment are encouraging. It is important that internists remember the frequency with which pediatricians encounter tuberculous mediastinal lymphadenitis, and the frequency with which it heals. A carefully taken history will often indicate this condition as the cause of otherwise obscure mediastinal roentgenographic observations, and would, perhaps, decrease the percentage of the "undiagnosed group" reported in this paper. Nevertheless, I feel that the authors' point as regards conservatism in making such a diagnosis is well taken.

DR. GERALD B. WEBB, Colorado Spring, Colo.: Dr. Voorsanger has well presented to us the difficulties we meet in the diagnosis of diseases of the chest which are not tuberculous. A hundred years ago the famous Addison was attempting a similar demonstration by clinical and pathologic studies. Influenza can certainly leave residual fractions of disease in the chest. Sergent and Rist of Paris taught that chronic cough resulting from influenza in men in the American Expeditionary Forces would be found to have associated infections of the accessory sinuses. This we found to be true, and our percentage of sinus infections today would seem much more than those reported by Dr. Voorsanger. It is our rule when the sputum is repeatedly negative to tests for tubercle bacilli to take stereoscopic pictures of the accessory sinuses. Illumination by the throat specialist is not sufficient to detect polypoid conditions of the antrums. Further investigation of the nose and throat, apart from the roentgenographic examination, is needed, and infections of the ethmoids and sphenoids are frequently found. Even irritation of the external auditory canal can keep up a chronic cough. The sputum should always be examined unstained as well as stained. Careful search should be made for such organisms as streptothrix and actinomyces. We also have found vaccines to be beneficial. I should like to ask Dr. Voorsanger whether he has noticed reaction and hemorrhage following their use. Empyema of the antrums and polypoid conditions of the nose and sinuses need surgical treatment. When this has been done it is still necessary to keep such patients with bronchial cough at rest for a prolonged period. One patient had to remain a year in bed before the cough disappeared. In pulmonary tuberculosis in the adult, it is unusual to get enlargement of the root glands. We have heard much coughing this morning, so that we could add tobacco to the list of causes of chronic coughs. I should like to ask Dr. McCrae whether he would include tobacco smoke inhalation with tar and gasoline fumes as a possible causative factor of malignant growths in the lungs. We, too, possibly find more cases of lung carcinoma than formerly. I would ask Dr. Jackson whether there is any danger in taking a piece of the lung tissue through the bronchoscope for microscopic examination. Unfortunately, most of us cannot have the highly skilled services of Dr. Jackson and we therefore irradiate some patients with doubtful diagnoses, finding such irradiation of benefit in chronic infections as well as in malignant conditions.

DR. PAUL H. RINGER, Asheville, N. C.: One point to be emphasized with regard to malignant pulmonary conditions is the great latency of the symptoms at the beginning. Very frequently these patients will begin to complain of symptoms anywhere from two to five months before the diagnosis is made, and, furthermore, these symptoms may not be at all referable to the lung or any portion of the respiratory tract. Cases are on record in which pains were reported in the leg to begin with, or in the arm, or in which there were urinary disturbances or an ataxic gait, all of which turned one's attention entirely from the underlying pulmonary condition which came to light only at a later stage and apparently was really the etiologic factor in every case. Dr. Palmer reported four cases of a primary malignant condition of the lung in which the symptoms were such as to cause the patient to be referred to the neurologic department of the Mayo Clinic, and quite recently at the Mount Sinai Hospital in New York, I heard Dr. Wessler report six cases showing symptoms quite unsuggestive of pulmonary involvement. As I do not come from a town where there is a bronchoscopic clinic, I can say nothing first-hand of the bronchoscopic methods in diagnosis. I am under the impression from the literature at my command that only primary malignant conditions of the lung are shown by bronchial ulceration. Metastatic growths in the lung do not ulcerate into the bronchi. The paper we have heard, and the authorities we have heard cited simply serve to show that we must turn to the method of bronchoscopic diagnosis more than we have. It is very important for more men to take up bronchoscopy.

DR. ELMER H. FUNK, Philadelphia: Dr. Jackson said that when malignant disease of the trachea, lung or bronchi is suspected, bronchoscopy may be of help in the diagnosis. If we look back over our experience as internists, we may turn Dr. Jackson's remark about and say that even when a malignant condition is not suspected, bronchoscopy may be of help in the diagnosis.

DR. ALBERT H. ROWE, Oakland, Calif.: The etiologic agents active in the nontuberculous group of patients with chronic bronchitis could be further identified with a more careful consideration of possible allergic causes. Those patients in whom allergy may be at the basis of chronic cough usually give a record of allergic manifestations, such as asthma, hay-fever, urticaria, eczema, migraine or food idiosyncrasies in the family. These patients also frequently give an indication of such allergic conditions in their own histories. In such a case we should make a thorough allergic study, including skin tests, with all types of proteins recognized as frequent causes of bronchial irritation, asthma or hay-fever. Thus all proteins of common foods, animal emanations, pollens of all types, indigenous to the patient's territory, and miscellaneous substances, such as orris root or pyrethrum, or active house and hay dust solutions, should be used in studying patients in which any suspicion of allergy is present. These tests should be done by the cutaneous method and supplemented by the intradermal method only when definite indications of protein sensitization are present and when the cutaneous test fails to confirm the suspicion. If the cases of asthmatic bronchitis discussed by Dr. Voorsanger should be thoroughly

studied from the point of view of allergic history, and testing and retesting done with a large number of proteins, many would undoubtedly be found sensitive to animal emanation proteins, proteins of food, pollen, or other miscellaneous substances. There is little evidence that bacterial sensitization as such is alone the cause of many cases of asthmatic bronchitis. The good results obtained by vaccine therapy are probably nonspecific in action or are due to the raising of immunity to bronchial infection in these cases of so-called asthmatic bronchitis which is usually secondary to other types of protein sensitization.

DR. H. F. STOLL, Hartford, Conn.: Until I heard Dr. Webb, I thought that the East was very far from the West in the explanation of the "undiagnosed" group of cases. In New England, we feel that sinus infections play an important rôle in these persistent coughs, not only in adults but frequently in children as well. The roentgen-ray examination must be made and interpreted by men who have had great experience. Furthermore, direct nasopharyngoscopic examination will sometimes show pus coming from the sinuses. I should like to ask whether any increase in blood pressure has been noted in the cases of malignant diseases of the lung treated by irradiation. Dr. Hartmann's demonstration in the Scientific Exhibit shows the development of hypertensive disease and hypertrophy of the heart following intensive irradiation over the hilum of the lung.

DR. CHARLES L. MINOR, Asheville, N. C.: It has been impressed on me frequently that we do not think sufficiently of possible malignant conditions in these roentgen-ray pictures. Only a year ago I saw a case that had been studied in two university clinics in the United States and in other places, and yet the malignant nature of the growth was overlooked. I was convinced that it was a case of tuberculosis, although I was unable to find the bacilli. The general practitioner cannot afford to neglect chronic cough as he has done in the past. That some of these chronic coughs are nontuberculous is true, but it is hard to say how many examinations must be made before one can be sure that the cough is not tuberculous. Certainly it is better to play safe. Many men are doing bronchoscopies, but there are few Jacksons. I would take Dr. Jackson's word without hesitation, but I would hesitate to accept the word of some so-called bronchoscopists. Although the roentgen-ray interpretation of the sinuses is important, it is work that the average man is not trained to do.

DR. WILLIAM C. VOORSANGER, San Francisco: In answer to Dr. Webb's question, reactions have occurred but never a hemorrhage and I am wondering whether, after all, these might not have been coincidental. I have seen a very violent reaction at the start of a second series of vaccines when the dosage has not been carefully controlled. We were not discussing allergic conditions. It would take us too far afield to go into foreign protein sensitization. We are not dealing with true bronchial asthma. We call our cases infectious bronchitis and asthma for want of a better term. They are a peculiar group of infectious conditions that have developed since the influenza epidemic of 1918, and we believe that certain cases are amenable to vaccine treatment, although I am not in favor of generalized vaccine treatment. We simply experimented with them in the hope that something might be accomplished. In regard to sinus infection, I agree that many coughs are due to sinus disease. In this group of 200 cases, 6 per cent were due to sinus infection. We stress in our paper that it is important in every chronic cough to examine the sinuses carefully. I agree that we must have an expert sinus man and an expert roentgenologist to examine these patients. In answer to Dr. Morgan, of course we had to take the reports of our laboratory. We are not trying to bring out anything very new. Nontuberculous conditions have been studied for a great many years. We are simply trying to classify them. In answer to Dr. Minor, I do not want to appear as saying that a great many of these conditions are not tuberculous. I believe that chronic cough is liable to develop as bronchiectasis or tuberculosis. I would rather have tuberculosis than bronchiectasis. If we were to study beginning bronchitides with the same care that we started to study incipient tuberculosis twenty-five years ago, we could obtain the same result.

DR. THOMAS MCCRAE, Philadelphia: With reference to Dr. Webb's question as to the possible influence of tobacco, I do not know. I hope that it does not affect malignant growths. It is very difficult to see why tobacco should have a particular effect in recent years, unless it is because of the tremendous increase in the consumption of cigarets. As to Dr. Morgan's point with reference to the absence of tubercle bacilli in acute lesions, if the lesions are chronic, involving a considerable part of the lung and are accompanied by hemorrhage and a good deal of sputum, the odds are against tuberculosis being present and something else should be thought of. I am not able to answer Dr. Stoll's question on blood pressure.

DR. CHEVALIER JACKSON, Philadelphia: In answer to Dr. Webb's question as to the danger of bronchoscopy, it may be said that there is absolutely no danger whatever connected with inserting a bronchoscope. The removal of a specimen of tissue, however, must be considered under two heads. First, if the removed tissue is cancerous, is removal dangerous? It is not. We have never seen any ill result follow the removal of endobronchial cancer. Even in the exsanguinated patient who was almost moribund from hemorrhage, the removal of the specimen did not start the hemorrhage again and did not affect the patient in any way. In the case of endobronchial endothelioma, bronchoscopic removal of the entire growth was not followed by any reaction or hemorrhage. Second, when it comes to the danger of removal of what afterward has proved to be granulation tissue, the product of inflammation, we have abundant experience. In one patient we sometimes remove granulations a dozen or more times to improve drainage in the progress of the bronchoscopic treatment of chronic abscess, and we have never yet seen any ill result from the removal of those granulations. No ill result has followed the removal of epithelized granuloma, tuberculoma, syphiloma or any benign growth. Therefore, I think it can be said that the removal of a specimen of endobronchial abnormal tissue is not dangerous; but if there is a peribronchial condition crowding into the bronchus and the lesion is outside the bronchial wall, it would probably involve a great deal of danger to go through the bronchial wall. I have never done that, so I cannot answer definitely from clinical experience. There is one very great danger that must be eliminated beforehand by the internist and the fluoroscopist. If the abnormal tissue should prove to be the beginning intrusion of an aneurysm into the lumen of the bronchus, the danger of removal would be very great.

Preparation for Specialism.—The best preparation for specialism is, in general, an experience as a general practitioner. My contention is that one of the best preparations for a general practitioner is some study and some experience as a specialist. And I would permit this specialism to start in the medical school. A college that consciously trains a man to be mediocre—for in spite of the contention to the contrary, that is what this plan implies: to know a little, only the essentials in the many subjects—is training along wrong lines. It is an injustice to the student. Somewhere in his course each student should be given the opportunity to learn the meaning of the word thorough. He should pursue the study of some subject or a few subjects far beyond the elementary phase; he should do intensive, concentrated work along that line, undeterred by the cry of those to whom this seems like specializing. Unless this majoring—let us get rid of the offensive term specializing—is done in the study of medicine, the doctor who is turned out is ordinary; power that may be lying dormant within him and of which he is unconscious is never developed; he is a man with no particular aim, diffuse and forceless. His later work lacks live interest. He becomes a mere money-getter. He loses self-respect. Unless he feels the incentive that comes from a conscious drive toward superiority in some one or a few lines, he stagnates and is soon a negligible quantity.—Herrick, J. B.: *California & West. Med.* **27**:183 (Aug.) 1927.

Clinical Notes, Suggestions and New Instruments

DERMOID CYST OF THE FLOOR OF THE MOUTH

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PHILADELPHIA

This case is presented because, first, it illustrates one of the unusual conditions that occur about the mouth and, secondly, it brings out the possibilities of uncommon diagnoses of rare pathologic conditions about the jaws—conditions that arouse the interest of the oral surgeon.

REPORT OF CASE

A school girl, aged 15, with a large swelling under the tongue, stated that during a physical examination, three weeks before, attention was directed to this swelling, but that prior to this time she had not noticed anything unusual or abnormal existing in her mouth. She had not had pain or discomfort. Within the past two weeks she had noticed a rapid growth of the swelling, and for the first time she was beginning to have difficulty with speech and mastication. There was nothing in the past medical history that had any bearing on the present condition. The family history was negative.

Fig. 1.—Dermoid cyst of floor of mouth.

Physical examination showed a semisoft, nonmovable tumor mass occupying the region beneath the tongue and displacing the tongue upward. This tumor mass was about the size of a large walnut, and extended from the margin of the molar and bicuspid teeth on the one side to the corresponding teeth on the opposite side, and from the sublingual frenum to the incisal plane of the lower incisor teeth. The membrane over the mass was under tension and of a yellowish white appearance; this area was not tender to touch nor was discomfort produced even when considerable pressure was brought to bear on it. Palpation within the mouth did not show involvement of the submaxillary glands. No external bulging under the jaw was evident. A roentgenogram of the mouth was negative.

Under ether anesthesia (intrapharyngeal method) an intraoral midline incision was made of sufficient length to expose the tumor thoroughly. By blunt dissection, the tumor mass was exposed and completely enucleated from a position situated deeply between the geniohyoglossus muscle strands.

The following pathologic report was submitted by Dr. J. R. Paul, pathologist to the Pennsylvania Hospital:

"The specimen consists of a small, spherical, encapsulated fluctuant mass, about 3 cm. in diameter and weighing 15 Gm. The capsule on one side is somewhat more opaque than on the other. On section a thin fibrous capsule is seen enclosing globular, white, fatlike masses which vary from 2 to 8 mm. in diameter and many tiny, dark yellow, fatty masses about 1 to 2 mm. in diameter. Both varieties float on water and are surrounded by a small amount of serous fluid. No hairs are found in the cystic cavity. Microscopic examination shows the cyst wall to be thin and delicate. On the inner side it is lined by a thin layer of definitely stratified epithelium ranging from four to eight cells in depth. There is a slight degree of keratinization on the inner surface. The remainder of the cyst wall is composed of a thin layer of fibrous tissue in various stages of hyalinization. Scattered through this wall at irregular intervals are elongated groups and islands of cells which show a reticular or foamy cytoplasm bearing close resemblance to the cells normally forming the sebaceous cysts at the base of a hair follicle. The mass of material within the lumen of the cyst is quite amorphous."

Recovery was complete and uneventful.

COMMENT[1]

It would seem quite probable that the specimen was a dermoid cyst. The diagnosis was based on the finding of an inner lining of stratified epithelium and the finding of cells

Fig. 2.—Interior of cyst.

quite characteristic of sebaceous glands together with the fatlike contents of the cyst.

Dermoid cysts, as referred to by Dr. MacCallum and others,[2] are considered a simpler form of teratoma, no line being distinguished between them and the more complex teratomas. They are composed essentially of dermatives of the ectodermal layer.

It is interesting to note that it was not pain that brought the patient to the hospital but the interference of the mass with the movements of the tongue. Those cysts are benign and only when, because of their size, they encroach on adjacent tissues do they become dangerous to the individual.

Although the cyst wall was pressing against the ducts of the submaxillary and sublingual glands, no apparent interference with the function of these organs resulted.

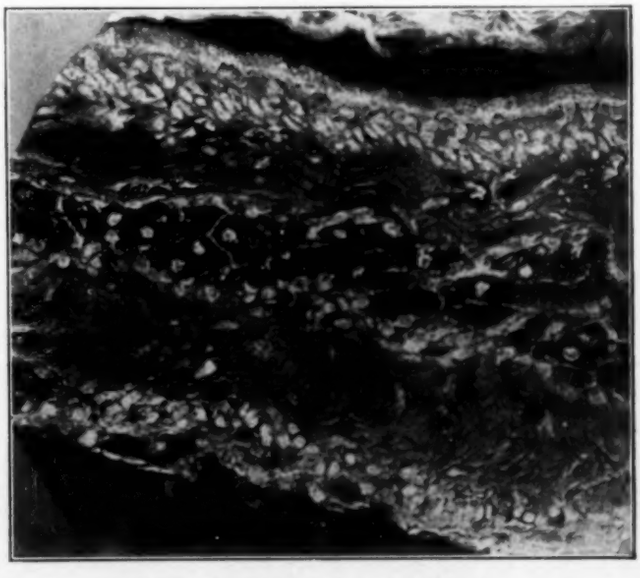

Fig. 3.—Microscopic section of cyst.

Another point of note is the fact that great care must be taken in "shelling out" or enucleating the cyst that the cyst wall or sac be not ruptured, for on this the success of the operation largely depends.

1. Paul, J. R.: Report Spec. 12267, Pennsylvania Hospital.
2. MacCallum: A Textbook of Pathology, Philadelphia, W. B. Saunders Company, 1924, p. 1087. Gilman, P. K.: Surg. Gynec. Obst. **22**: 672 (June) 1916. Colp, R.: Dermoid Cysts of the Floor of the Mouth, Surg. Gynec. Obst. **40**: 183-195 (Feb.) 1925. Hasset: Beitr. z. klin. Chir. **83**: 332, 1913.

URINARY DISCOLORATION RESULTING FROM CHEWING A BLUE BLOTTER

FRANCIS A. FAUGHT, M.D., PHILADELPHIA
Physician, Misericordia Hospital

L. Y., a girl, aged 11, was put to bed by her observing mother because she noticed that the child was passing a bluish-green urine. After twenty-four hours' observation the urine was still discolored. As the urine remained discolored for more than twenty-four hours, the mother became more alarmed and sent for me. The appearance of the urine was quite characteristic of that of patients taking methylene blue.

Careful questioning disclosed the fact that the child had the habit of chewing paper while reading, and she finally admitted that during the past two days, while reading a book, she consumed part of a blue blotter.

Investigation of the dye industry in relation to the pigments used in blue blotters disclosed the fact that colors other than methylene blue or direct blue are rarely used on account of their relatively high cost, and since a portion of this blotter responded to all the usual tests for methylene blue, it is assumed that this is a case of methylene discoloration of the urine following mastication and swallowing of portions of a blue blotter.

The removal of this unusual substance from the diet resulted in a prompt disappearance of the discoloration of the urine.

TARSAL-METATARSAL DISLOCATION

ROBERT B. ACKER, M.D., SOUTH BEND, IND.

Injuries of this type are rare. Wilson and Cochrane describe two forms of tarsal and metatarsal dislocation, one a so-called divergent form in which the metatarsals are displaced both outward and inward, and a second in which the metatarsals are displaced upward in relation to the tarsus. Neither is the same as the type of dislocation here described.

This type of dislocation is especially liable to be a compound injury, as the force necessary to its production must be great. The usual method of production is a direct run-over

Fig. 1.—Dorsal view, showing type of dislocation.

by the wheel of a vehicle with the foot held in a side position and fixed. The force is applied at one margin of the foot and toward the opposite margin. Practically speaking, I do not believe that an injury exactly of the type shown here could be produced in any other manner. The automobile, by means of its great weight, is able to transmit a considerable force directly by means of a pneumatic rubber tire. A pneumatic tire has some resilience when in contact with the human body and may produce an extensive or unusual injury to bone without breaking the outer covering of skin. Such was the happening in this instance.

REPORT OF CASE

A boy, aged 11 years, was knocked to the pavement by a motor car. At least one rubber tired wheel passed over the inner side of his foot, while the outer side of his foot rested on the pavement with the rest of his body in a prostrate position. This was not a compound injury. The skin remained unbroken and very little discolored. The most noticeable deformity was that due to the prominence of the displaced first cuneiform bone, which protruded directly beneath the skin on the inner side of the foot (fig. 1).

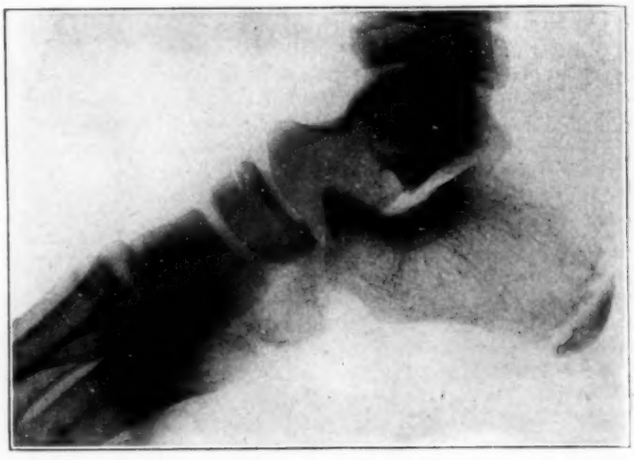

Fig. 2.—Lateral view in which the position of the bases of the metatarsals is shown; before reduction.

Reference to figure 1 will show that the first, second, third, and possibly the fourth metatarsals were displaced toward the outer side of the foot and that the first cuneiform bone

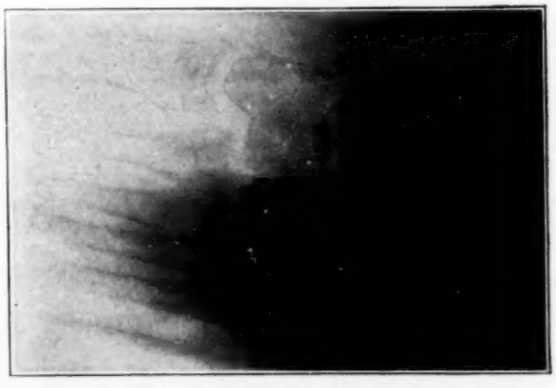

Fig. 3.—Dorsal view, retouched, after reduction; taken through cast.

was displaced or somewhat rotated toward the inner side. In figure 2, which gives the lateral view of the injured foot, it will be seen that the bases of the metatarsals were dis-

Fig. 4.—Lateral view, retouched, after reduction; taken through cast.

placed upward only a slight amount, if any, in relation to the tarsus.

The interesting features about this case are the extensive bone displacement without compounding, the displacement of

the metatarsals outward in relation to the tarsus with practically no upward or downward displacement, and the displacement or rotation inward of the first cuneiform bone.

Reduction was made without open operation. The foot was manipulated and molded and by this means a very satisfactory replacement of the dislocated bones was made. The functional result was excellent. Figures 3 and 4 give a good idea of the reduction obtained, although the roentgenograms were taken through a plaster cast.

211 Pythian Building.

A PNEUMATIC HAMMER FOR BONE SURGERY

HORACE C. PITKIN, M.D., BOSTON

A pneumatic hammer was recently installed in the orthopedic operating room of the Massachusetts General Hospital, and met with such instant approval that a report of its salient features is here presented.

Shorn of technical detail, the essential features of the apparatus are:

1. An adequate supply of compressed air, preferably generated outside and piped to some convenient point in the operating room.

2. A reducing valve capable of maintaining any desired working pressure in the line distal to itself, regardless of the rate of air flow, and providing for instant adjustment under the direct supervision of the operator.

3. A satisfactory air cleaner. This is essential because the waste air is necessarily exhausted in the sterile operating field.

4. A light, compact, pneumatic hammer whose speed is controlled by a throttle conveniently situated on the pistol-grip handle. The hammer has a top speed of 3,800 blows per minute, the weight of each blow depending on the working air pressure.

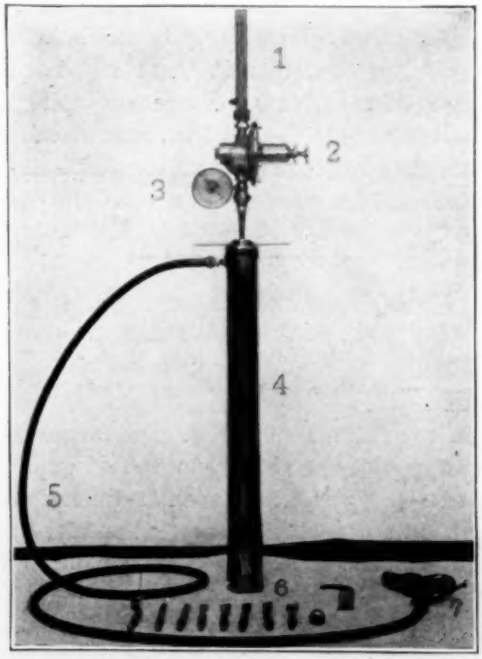

Fig. 1.—Operating room assembly: 1, delivery hose; 2, reducing valve; 3, pressure gage; 4, air cleaner; 5, sterilizable tubing; 6, osteotomes, etc.; 7, pneumatic hammer.

5. Osteotomes and other percussion instruments whose butts have been slightly altered to fit the hammer. A detachable butt provides for the adaptation of these tools to the use of a hand mallet if necessary.

The outstanding advantages of such an outfit are:

1. Abundant power under perfect control.

2. Accurate tooling with decreased risk of accidental fracture, as the tools are impelled by a rapid series of minimal taps.

3. Speed, limited only by the skill of the operator, yet without any possibility of charring the cut surfaces.

4. Ability to operate in deep wounds through small exposures.

5. Absence of exposed moving parts.

6. Ease of sterilization, the hammer being boilable without having to be taken apart.

Fig. 2.—Detail of hammer in operation. Note convenience of throttle to right thumb.

7. Freedom from petty mechanical derangements, as a result of the simplicity and sturdy design of the hammer, which is a standard, proved instrument.

8. Freedom from necessity of reduplicating instruments already owned.

9. Finally, as distinct from all electrical apparatus, absence of the contraindications imposed by the use of ethylene or other explosive anesthesia.

The outfit was assembled or made to the author's specifications by Hiller and Heuser, instrument makers, Boston.[1]

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

DIPHTHERIA TOXIN-ANTITOXIN MIXTURE (See New and Nonofficial Remedies, 1927, p. 340).

Parke, Davis & Company, Detroit.

Diphtheria Toxin-Antitoxin Mixture, 0.1 L+.—(See New and Nonofficial Remedies, 1927, p. 341.)—Also marketed in packages of 30 bulbs (*Bio. 68*) each containing 1 cc., representing ten immunizing treatments.

1. It is described in detail in the Journal of Bone and Joint Surgery **9:** 505 (July) 1927.

Rationalized Preventive Medicine in Industry.—Industrial health supervision provides exceptional opportunities for the collection and analysis of morbidity material which is otherwise practically unobtainable. It is only through the careful measurement of this experience that we shall provide a rational basis for the inauguration of changes which must come if progress is to be made in industrial hygiene. Up to the present time, attention has been concentrated mainly on accident experience. More thought and effort should be put on the collection and analysis of material based on minor illness and physical defects. These data could form the background of rationalized preventive medicine in industry.—Sappington, C. O.: *Am. J. Pub. Health* **17:**713 (July) 1927.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, OCTOBER 1, 1927

ULTRAVIOLET RADIATION AND BASAL METABOLISM

A new method of therapy, and similarly a new drug, may become a help to mankind in the hands of an intelligent physician or may furnish an opportunity for the most objectionable quackery on the part of untutored persons. Probably the greatest menace as well as the largest opportunity for unwise if not actually fraudulent practice lies in the tendency to draw unwarranted generalizations from a restricted group of facts. In some such way, for example, the health-promoting vitamins have indiscriminately been accredited with curative potencies for almost every category of human ills from constipation to cancer. The clear-cut experimental proof of the relief of dietary xerophthalmia in certain species by the inclusion of milk fat in the ration promptly becomes magnified into the promiscuous assertion that eye diseases are cured by vitamin A. Such ridiculous and obviously unwarranted generalizations would do like harm if their influence did not extend beyond the printed page. Unfortunately, they often lead to false hopes and incidentally to useless if not harmful therapeutic effort. Every ill advised attempt to cure the sick or alleviate their distress makes succeeding attempts more difficult and the patient less confident about the altruism of modern medicine.

Ultraviolet radiations have attained exceptional prominence within the past two years as possibilities of therapeutic potency. The health-promoting possibilities of sunshine have been exploited so long that they have gained a fixed acceptance by the laity, even though a scientifically minded person might find difficulty in assessing the alleged benefits in terms of demonstrable reactions. Those who court sunshine at the seashore or in the mountains are likely to include a variety of new factors in their vacation regimen. Outdoor life means far more than mere exposure to the sun's direct rays. Climate, exercise, freedom from worry, and altered dietary habits enter into the changed mode of existence. What shall be held responsible for the beneficial response, when it occurs?

The demonstration that some of the measurable physiologic effects of solar rays are due to the ultraviolet components and the circumstance that ultraviolet rays can readily be generated by suitable mechanical appliances without dependence on the vagaries of sunshine have helped to foster the current awakening of interest in this type of radiation. It is definitely known that in the rachitic person both sunshine and ultraviolet rays may bring about increases in the content of calcium and phosphorus in the blood—a preliminary to the cure of rickets. After irradiation, general improvement of health has been observed in many cases. It may be attended by increase in appetite, gain in weight, improved sleep, or less well defined signs. Such symptoms are sometimes referred to by the vague designation of improved metabolism.

It is possible to measure certain aspects of the energy exchange in the body with an accuracy that permits dependable statements. The study of the basal metabolism after ultraviolet irradiation has been carried out at the Mount Sinai Hospital in New York by Fries.[1] Even after repeated exposures during periods of several weeks in the case of children, the subsequent basal metabolic rates did not vary more than 10 per cent as a rule; nor were there any demonstrable uniform effects immediately after the individual irradiations in therapeutic dosage. The records of the pulse rate, another index of changes in metabolism, were equally negative. For the present, therefore, it may be concluded with the New York investigators that there will not be any change in basal metabolism, pulse rate or blood pressure in the majority of children as the result of exposure to therapeutic doses of ultraviolet rays. Apparently other physiologic reactions must be studied for signs of response.

SOME RECENT ASPECTS OF VITAMIN B RESEARCH

The stimulus for the early studies in the field now designated as that of dietary deficiency disorders was derived in no small measure from experiments on birds. The starting point was the production of experimental polyneuritis—polyneuritis gallinarum—in hens and the demonstration that it could be averted or cured through the use of suitable food alone. The pioneer investigations of the Dutch scientists Eijkman and Grijns, working in Java, paved the way for Funk's studies on pigeons, researches responsible for the introduction of the word vitamin into physiologic literature. The story of the abnormal behavior of pigeons kept on a diet of polished rice and their astounding recoveries when small amounts of certain supplementary foods or food "accessories" are added to the ration has become a classic. Subsequent experimentation has

1. Fries, Margaret E.: Effect of Therapeutic Doses of Ultraviolet Irradiation on Basal Metabolism in Children: First Paper, Am. J. Dis. Child. **34**: 159 (Aug.) 1927. Fries, Margaret E., and Topper, Anne: Second Paper, Immediate Effect, ibid. **34**: 166 (Aug.) 1927.

been directed, on the one hand, toward the discovery of the chemical nature of the potent agent, the antineuritic vitamin, and, on the other, to securing a clearer conception of the pathology of the "avitaminosis" of rice-fed pigeons as well as some idea of the nature of vitamin function.

Among the features observed in so-called polyneuritic pigeons are loss of weight, gradual fall of body temperature, indications of abnormal alimentation, changes in some of the organs, such as the suprarenals, convulsive symptoms, and degenerative alterations in the nerves. The latter have been particularly stressed. A characteristic of the avitaminotic animals is their failure to eat. A careful investigation of these manifestations by Kon and Drummond [1] at University College, London, justifies the conclusion that most of them are merely the expression of the effects of inanition as the result of insufficient food intake. It seems quite certain, for example, that starvation and the wasting associated with it are largely if not entirely responsible for the pathologic nerve changes observed in vitamin B deficiency in pigeons. Acute nervous symptoms, indicated by abnormal postures in the birds, were among the earliest described peculiarities of avitaminotic pigeons that are promptly alleviated by corrective feeding. The British workers have pointed out that obviously nerve regeneration is not possible in the few hours which elapse before recovery from the nervous symptoms under the influence of vitamin B. There is no logical impediment, however, they add, in assuming that the paralytic form of pigeon's beriberi, which is not curable or is curable only with difficulty by vitamin administration, may be associated with nerve degeneration. The acute symptoms are avitaminotic in origin; the chronic degenerative changes are due to inanition and can be induced by underfeeding even when the vitamin supply is not diminished. Partial starvation will, of itself, induce most of the abnormalities of loss in weight, lowered temperature, and alterations in the level of the blood sugar concentration that have so often been attributed to vitamin deficiency per se.

A number of theories attributing to vitamin B an essential influence on the production or functioning of the oxidative mechanisms of the tissues have already been discredited. The work of Kon and Drummond also throws doubt on the hypotheses that make vitamin B control the carbohydrate metabolism of the body. In fact, none of the theories relating vitamin B to the digestive and assimilatory functions of the organism seem tenable any longer; nor has the origin of the nervous syndrome characteristic of vitamin B deficiency been adequately explained. The most definite statement permissible at present is summarized in the conclusion that lack of appetite for deficient food and acute nervous symptoms are characteristic of vitamin B deficiency in the pigeon. We agree with Kon and Drummond, however, in supporting the opinion expressed by Karr,[2] as the result of his studies at Yale University, that "some relationship exists between the desire to partake of food and the amount of the so-called water-soluble vitamin ingested.[1]

The search for the chemical substance or substances that represent vitamin B has shown that they are elusive. Reports of the isolation of the vitamin in crystalline form have repeatedly been published, only to be found premature or incorrect. The question of the identity of the antineuritic substance and the so-called growth-promoting factor has repeatedly been debated. The evidence seems to be growing in favor of a duality of substances. Yeast is a rich source of both. One is comparatively thermostable and may be identical with Goldberger's alleged pellagra-preventing factor. The other is relatively labile, particularly in the presence of alkalis, and may represent the antineuritic potency. Both seem to be essential to well being.[3]

1. Kon, S. W., and Drummond, J. C.: The Physiological Rôle of Vitamin B: Part III. Study of Vitamin B Deficiency in Pigeons, Biochem. J. **21**: 632, 1927.

2. Karr, W. G.: J. Biol. Chem. **44**: 255 (Nov.) 1920.

3. Goldberger, Wheeler, Lillie and Rogers: Pub. Hlth. Rep. **41**: 297 (Feb. 19) 1926. Chick, Harriet; and Roscoe, N. H.: On the Composite Nature of the Water-Soluble B Vitamin, Biochem. J. **21**: 698, 1927. Hassan, A., and Drummond, J. C.: The Physiological Rôle of Vitamin B: Part IV, ibid. **21**: 653, 1927.

SURGERY AND FATAL PULMONARY EMBOLISM

A recently published statistical summary of the occurrence of fatal pulmonary embolism among surgical cases that have come to necropsy in a large American clinic during the last ten years shows an incidence of 6 per cent.[4] This is a figure of sufficient magnitude to warrant critical study. It might be expected that the formation of thrombi or other emboli is dependent primarily on the surgical interventions that have occurred in the recorded fatalities. Injuries to the walls of blood vessels with resultant thrombosis are an inevitable accompaniment of many operations. Indeed, as a surgeon has remarked, thrombosis within veins that have been cut is a normal occurrence and necessary to the completion of any surgical procedure. This should extend within the vessel to the point of entrance of the next tributary vein; when it extends beyond this point into the larger vessels, a pathologic condition of grave peril is created, as portions of the clot may become detached in the blood stream. The new study indicates, however, that frequently the site of operation is not of paramount importance in determining the site of thrombosis and the source of emboli.

According to Henderson's [4] observations at the Mayo Clinic, patients who die from pulmonary embolism are older than the average surgical patient; they are somewhat overweight, and, as a group, have a normal or somewhat subnormal blood pressure; a high percentage have postoperative infections. While the importance of the operative procedure in determining the site of

4. Henderson, E. F.: Fatal Pulmonary Embolism, Arch. Surg. **15**: 231 (Aug.) 1927.

thrombus formation and the occurrence of pulmonary embolism cannot be overlooked, he adds, other factors, such as age, weight, general condition of the patient, efficiency of the circulation, bodily inactivity incident to almost any operative procedure and infection, should also be emphasized.

The circumstance that pulmonary embolism following operation seems to be a more common cause of death of the obese patient than of the average patient is apparently not due to the formation of true fat emboli, as might have been suspected. According to Snell,[5] after operation on obese patients there may be an increased liberation of thromboplastic lipoid substances such as cephalin, as a result of the extensive areas of fat invaded. True fat embolism, however, has rarely occurred in the postoperative deaths of the obese patients under observation by him.

It is conceivable that major operations tend to bring about changes in the blood that predispose to vascular thrombosis. Chemical investigations made by Allen[6] on the blood of surgical patients of the susceptible types in fact indicate possibilities in this direction. The number of erythrocytes and leukocytes, the prothrombin time, the fibrinogen and the lipoids show definite and constant changes which may fairly be attributed to the operative interventions. Allen therefore regards it as probable that there is a nonspecific physiologic response to operation which occurs independently of the clinical or surgical status of the patient. This nonspecific physiologic change, he believes, produces definite alterations in the blood which may partially explain the relatively high incidence of pulmonary embolism occurring in surgical patients as compared with nonsurgical patients. As he interprets the condition there is probably in every surgical patient a definitely increased potentiality for intravascular coagulation by virtue of these changes, but this in all probability plays a minor part in comparison with other factors in the actual deposition of the clot and the subsequent pulmonary embolism.

One feature of intravascular changes attending operations which seems to have been more definitely cleared up by the researches at the Rochester clinic concerns postoperative phlebitis. According to Brown,[7] this can no longer be held responsible for the observed fatal pulmonary embolisms. Phlebitis suggests a seasonal incidence similar to that observed in duodenal ulcer. According to Brown, pulmonary infarction is a common complication, while fatal pulmonary embolism is apparently rare. This, he believes, verifies a surgical impression of the relative safety of phlebitis. The explanation for this, he adds, must rest on the fact that phlebitis is an inflammatory lesion. The clot is firmly attached to the wall of the vein, and large fragments are not easily dislodged. Thus renewed recognition of the serious importance of pulmonary embolism and the urgent necessity of further investigations become imperative.

5. Snell, A. M.: The Relation of Obesity to Fatal Postoperative Pulmonary Embolism, Arch. Surg. **15**: 237 (Aug.) 1927.
6. Allen, E. V.: Changes in the Blood Following Operation, Arch. Surg. **15**: 254 (Aug.) 1927.
7. Brown, G. E.: Postoperative Phlebitis, Arch. Surg. **15**: 245 (Aug.) 1927.

PELLAGRA

Economic stress, accompanied by an unbalanced dietary, has affected some of the recently flooded areas of the lower Mississippi Valley. Pellagra, accordingly, has increased. In that area, in 1924, the reported cases of pellagra numbered 20,000 and the reported deaths, 1,020; in 1927, according to an estimate made by Goldberger and Sydenstricker, the number of cases of pellagra will be from 45,000 to 50,000 and the number of deaths, from 2,300 to 2,500.[1] This forecast has impelled the United States Public Health Service to disseminate recent information[2] on the nature and prevention of the disease.

In certain sections of the South, during hard times, the diet becomes restricted substantially to meal, salt pork and molasses. This ration, since it is low in the "pellagra-preventing dietary essential" vitamin P-P, will not forestall the development of the disease. When the food supply is poor in this vitamin, certain symptoms appear. Unfortunately, they are indefinite in early cases. Nevertheless, in regions where pellagra is prevalent, suspicion should be aroused by the occurrence in a patient of loss of strength, indigestion and nervousness, dizziness, discomfort or pain in the epigastrium, headache, wakefulness, and constipation. If, furthermore, there are burning sensations of the hands or feet or mouth, a reddened tongue and diarrhea, the evidence of pellagra is more definite. In the presence of any or all of these symptoms, inquiry as to a patient's eating habits is indicated. In well advanced cases, the main dependence can be placed on the eruption, which, when it first appears, may be mistaken for sunburn. Next, the skin takes on a dirty brown and frequently a parchment-like appearance. Soon afterward, it becomes rough and scaly, or cracks and peels. These skin manifestations are characteristically bilateral and their most common sites are the backs of the forearms and hands and the backs of the feet. Other portions of the body surface that should be inspected in suggestive cases are the sides and front of the neck, the face, the arms, the elbows, the legs and the knees. Inquiry will frequently reveal that patients who present these symptoms have been living on corn-meal, salt pork and molasses.

As yet, the quantities of vitamin P-P in the various foodstuffs are unknown, but there is reason to believe that the substance is present in small amounts in milk, vegetables and fruits, and in larger amounts in lean beef, mutton, pork, fish, fowl, yolks of eggs and pow-

1. Amount of Pellagra Abnormally High, General News, J. A. M. A. **89**: 891 (Sept. 10) 1927. Diversified Diet Recommended to Check Pellagra, the United States Daily, Aug. 26, 1927. Yearly Index 1803.
2. Goldberger, Joseph: Pellagra, Its Nature and Prevention, Pub. Health Rep. **42**: 2193 (Sept. 2) 1927.

dered yeast. Dried pure yeast has the greatest content of this vitamin of any foodstuff known at present. For use as a food, the yeast plant preferably should be dead. It can be killed by stirring the dry yeast into some water and boiling the mixture for about one minute. The adult dosage is 1 ounce a day, or two teaspoonfuls taken three times a day. A child under 12 years of age should be given half of the adult dose. These foods, in suitable quantities, must be consumed regularly at all seasons, for recovery from one attack of pellagra does not confer immunity. If the diet again becomes deficient, the disease will recur. Therefore, according to Goldberger, "every effort must be made by the individual and by persons in positions of influence to improve available food supplies by the promotion of diversified farming, the ownership of good milch cows, and the cultivation of more and better gardens."

Pellagra is no doubt still a problem that has not been completely solved. The careful studies of Goldberger seem, however, to point the way definitely to a practical means of prevention and of cure. It is fortunate that the knowledge is available at a time when such a disaster as the great Mississippi floods makes it especially valuable.

Current Comment

THE PANGS OF HUNGER

Modern physiology has at length supplied an interpretation, if not an actual explanation of the sensations of hunger and appetite. They are due to different causes, the former, as Macleod has expressed it, being definitely correlated with contraction of the empty stomach, whereas the appetite is a complex of sensations operating in the nervous system along with memory impressions of the sight, taste and smell of palatable food. Such an explanation makes appetite a highly complex nervous integration, whereas hunger is a much simpler process. The larger features of the so-called hunger contractions have now become incorporated into present-day teaching. They consist of powerful rhythmic contractions alternating with periods of quiescence and are usually said to be superimposed on a tonus rhythm. The sensation of hunger is definitely associated with the rhythmic contractions and is the more marked when the latter are augmented. Most of the observations dealing with these topics have been made by means of graphic registration of the contractile changes. Recently Rogers and Martin[1] of Baylor University in Texas have supplemented this technic with roentgenographic and fluoroscopic examinations of the gastric hunger contractions of healthy persons. The outcome leads to some modification of current views, particularly with respect to the participation of the less muscular fundus in the phenomena. The new records indicate that the gastric hunger motility is a mixture of at least two types of activity: first, hyperperistalsis and, second, tonic or circular contraction of the lower third or antral end of the stomach. Visible tonic or maintained contractions of the fundus were not constant characteristics of hunger contractions; sometimes this portion of the stomach has been found dilated or distended by the greater degree of contractility of the lower portion of the stomach; at other times there has appeared an apparent shortening or contraction of the entire fundus. The most striking feature reported by Rogers and Martin is the observation of the complete obliteration of the lumen of the lower portion of the stomach at the height of the hunger contraction. It is at this time, they record, that the subject feels the contraction most intensely. This knowledge may not be particularly consoling when the pangs of hunger are on us, but there is surely some satisfaction in realizing "where the trouble lies."

1. Rogers, F. T., and Martin, C. L.: A Roentgenological Study of Gastric Hunger Motility in a Series of Healthy Men, Am. J. Physiol. **82**: 113 (Sept.) 1927.

INTERRELATIONS OF THE GASTRO-INTESTINAL TRACT AND THE EYE

Perturbances of vision in one way or another are often charged with responsibility for "upsets" in parts of the body remote from the eye regions. In the popular mind that vague something frequently designated as eyestrain can produce discomfort and even conditions far less tolerable than ordinary "malaise." The attempts at a scientific explanation that are expected of the physician now and then are rarely productive of convincing interpretations. Pearcy and Allen[1] of the University of Chicago have recently succeeded in demonstrating how gastro-intestinal "upsets" may become associated with visual disturbances. Distention of the stomach or intestine in man produces a reflex disturbance in vision. Objects blur, especially near objects. The patient has difficulty in reading, partly because of the blurring and partly because of wandering of the attention. The blurring is not due to ametropia, heterophoria, or change in intra-ocular pressure, but to ciliary muscle hypotonia, that is, a reflex accommodative insufficiency, and retinal congestion and edema. The subjective changes represented by distraction of attention are part of the general nervous reaction to the alimentary distention. The demonstration that dietary indiscretions can affect the visual functions will afford another cogent argument in favor of moderation in eating and drinking—always a welcome theme with the hygienic reformer.

1. Pearcy, J. F., and Allen, T. D.: Studies on the Visceral Nervous System: Reflexes from the Gastro-Intestinal Tract to the Eye, Am. J. Physiol. **82**: 56 (Sept.) 1927.

Native Capacities and Instincts.—Native capacities differ from instincts in that they do not provide ready-made reactions to stimuli. We do not expect the musically gifted child to break out in song at some special stimulus, and thus reveal his musical gift. We expect him to show an interest in music, to learn it readily, remember it well, and perhaps show some originality in the way of making up pieces for himself. His native gift amounts to a specific interest and an ability to learn specific things. The gifted individual is not one who can do certain things without learning but one who can learn those things very readily.—Woodworth: Dynamic Psychology, p. 60.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

Personal.—Dr. Frank Vinsonhaler, colonel, Medical Officers' Reserve Corps, has relinquished command of evacuation hospital number 24 since accepting the deanship of the state medical school, and will be succeeded by Lieut. Col. Homer Scott, Little Rock. Colonel Vinsonhaler, assisted by his daughter, entertained the officers of the reserve hospital and their wives at dinner at the Shrine Country Club, Little Rock, August 12.

CALIFORNIA

Drugless Physician Writes Prescriptions.—A complaint was filed recently in Los Angeles against William E. Brown, D.C., charging him with practicing medicine without a license. The state board of medical examiners learned that Brown told one of his patients that he was a doctor of medicine and later that he was an osteopath, and that he gave a patient prescriptions for medicines which were obtained from his father-in-law, who is a pharmacist. The board's investigator found various prescriptions written by Brown in another local drug store. Some physician informed the board that Brown had requested assistance in an operation on a woman. He apparently has practiced medicine in the same locality for at least two years.

History of Orthopedic Hospital-School.—Several years ago, a few women organized the Crippled Children's Guild at Los Angeles, and located the homes in the city where there were crippled children who were unaware of how they might be helped. By 1917, they had sufficient funds to rent a small house where such children could be treated and trained. This was the beginning of the Los Angeles Orthopedic Hospital-School for Crippled Children. Seventeen influential

business men gave their time and funds to assist the guild, and when it became necessary that a more official connection with the work be made, they incorporated as the Los Angeles Orthopedic Foundation, not for profit or gain. A citizen then gave about 3 acres of land as a site for further development of the hospital-school work, and steps were taken to raise funds by public subscription to build suitable structures. The old English stable which stood on the site was renovated and was used as an outpatient department. Around this nucleus gathered hundreds of crippled children, while plans were being drawn for a main hospital. The first surgical operation in the new building was performed in the spring of 1922. Plans were at once made for the construction of a nurses' home and administration building; these were completed in the following spring. The institution now has a main hospital building, with a capacity of seventy-five patients, and more than 3,000 crippled children have been registered on its clinic records. The board of education of Los Angeles has assigned nine school teachers to the institution; there is conducted here the only school in southern California solely for handicapped children. The school work ranges from the elementary grades to high school, with occupational and vocational therapy. Children enter through the outpatient department, which is operated by the guild, comprising now more than 800 women. There is no charge for examination except a registration fee of 25 cents. Nine trained workers who specialize in orthopedics assist in the outpatient department, and volunteers supplement the regular staff in the less technical work. The orthopedic hospital-school is a charitable institution. Some parents desire to pay something and any amount is accepted. The institution is said to be also a home which gives these cripples hope and courage and teaches them to be useful members of society. One of the next steps will be the founding of an employment bureau. Much of the credit for the development and guidance of this work is said to be due to Dr. Charles L. Lowman, the chief of staff, who has been with the institution since it was founded. The site was given by Mr. John Brockman, and Mrs. Anita M. Baldwin gave $50,000 during the campaign for funds.

DELAWARE

State Medical Meeting.—The one hundred and thirty-eighth annual meeting of the Medical Society of Delaware will be held at the state hospital, Farnhurst, October 11-12. Following a business meeting in the morning, there will be a luncheon at the hospital and clinics by members of the consulting, visiting and attending staffs. The New Castle County Medical Society will give a dinner in the evening to members and guests, and the president's reception, a concert and dancing will follow. The out-of-state speakers will be Drs. Joseph Sailer, Philadelphia, on "Treatment of Heart Disease"; Charles W. Burr, Philadelphia, "Mental Disease and the Family Doctor"; George M. Dorrance, Philadelphia, "Surgical Treatment of a Cleft Palate"; Benjamin A. Thomas, Philadelphia, "Management of the Patient with Prostatic Obstruction," and probably Drs. William S. Thayer, President Elect of the American Medical Association, and Joseph C. Bloodgood, both of Baltimore. Among the Delaware physicians who will read papers will be Dr. Joseph S. McDaniel, Dover; Drs. William Wertenbaker, Bartholomew M. Allen and Joseph W. Bastian, all of Wilmington, and Drs. Walter R. Livingston and Persis F. Elfeld of the Delaware State Hospital. Every registered physician, whether he is a member of the state society or not, is most cordially invited to attend.

FLORIDA

Personal.—Dr. Anne H. M. Sharpe, formerly of Jacksonville, Ill., has been appointed professor of hygiene, Florida State College for Women, Tallahassee.——Dr. Eugene B. Elder has been appointed superintendent of the Morrell Memorial Hospital, Lakeland.——Governor Martin has reappointed Dr. Nicholas A. Baltzell, Marianna, a member of the state board of medical examiners.——Dr. William A. Oughterson, West Palm Beach, addressed the Palm Beach County Medical Society, August 8, on "Cardiac Decompensation."——Dr. Stephen C. Wood has been appointed health officer of Leesburg.

Appropriation for Health Work Reduced.—The Florida legislature has reduced the appropriation for the state health department, so that it is necessary to reduce its force and resources. In personnel, the cut made necessary includes five medical officers, four nurses, four sanitary inspectors and one assistant engineer, so that field workers now will be obliged to cover more than a dozen counties, whereas last year they averaged about six. The reduced nursing and sanitary forces will do their best for the health of the people, but the cut in personnel means that the nurses and sanitary inspectors will not be able to give as prompt attention to many requests as it was formerly possible to do. It will also be necessary, the state board says, to give up supplying entirely some biologic products.

GEORGIA

The Calhoun Lectureship.—In order that the Medical Association of Georgia may enjoy lectures by prominent visiting physicians, a movement is on foot to establish a lectureship to be known as the "Abner Wellborn Calhoun Lectureship," in honor of a past president of the association. The society hopes to raise six or eight thousand dollars, which, when invested, should yield sufficient income to defray the expenses of the visiting lecturers.

Society News.—Dr. Charles W. Roberts, Atlanta, read a paper before the Fulton County Medical Society, September 1, on "Congenital Anomalies of the Intestinal Tract."——Dr. William W. Young addressed the Fulton County Medical Society, Atlanta, September 15, on "Child Guidance in Rela-

tion to Psychiatric Problems."——Dr. Joseph Yampolsky, Atlanta, addressed the Fayette County Medical Society, August 31, on "Fevers of Unknown Origin in Infants."

IDAHO

State Medical Election.—At the annual meeting of the Idaho State Medical Association, Twin Falls, August 29-31, Dr. Alexander Barclay, Coeur d'Alene, was elected president, to be installed, Jan. 1, 1928, and Dr. Joseph N. Davis, Kimberly, was reelected secretary. The next meeting will be held at Yellowstone Park about August 20-25, 1928.

CHICAGO

Annual Dinner.—The Chicago Medical Society will hold its annual dinner, October 19, 6:30 p. m., in the Gold Room of the Congress Hotel, at $3 per plate. The occasion will be in honor of the ex-presidents of the society, each of whom will be expected to talk only three minutes. There will be dancing following the dinner, and cards for those who do not dance. A large representation from every branch is requested. The new officers will be installed at this meeting. The telephone number of the society is Central 3026; Dr. William T. Carlisle is chairman of the committee on arrangements.

First Meeting in New Auditorium.—The scientific meetings of the Chicago Medical Society henceforth will be in the auditorium on the fifth floor of the Medical and Dental Arts Building, 185 North Wabash Avenue, and the first meeting will be a joint meeting with the Chicago Tuberculosis Society, October 26. Dr. Ralph C. Matson, Portland, Ore., will read a paper on "Operative Therapy in the Treatment of Pulmonary Tuberculosis."——The Chicago Laryngological and Otological Society will meet, October 16, at 16 North Wabash Avenue; members of the Chicago Medical Society are cordially invited. Dr. Otto J. Stein will read a paper on "Leprosy Observations in Hawaii"; Dr. Robert Sonnenschein, "Hanau W. Loeb Memorial," and Drs. Joseph C. Beck and Harry L. Pollock, "Observations in European Clinics During Our Recent Visits."——The Chicago Society of Industrial Medicine and Surgery will meet, October 3, at the Great Northern Hotel, 8:30 p. m. Dr. John S. Coulter will read a paper on "Practical Consideration of Physical Therapy in Industrial Practice." A full attendance is requested, as several matters of importance will be disposed of.

Conference on Blindness.—The National Committee for the Prevention of Blindness has called a conference to be held in Chicago, October 13-15, in cooperation with the Illinois Society for the Prevention of Blindness, at which every important cause of blindness or serious impairment of vision will be discussed, and the methods found most effective in counteracting eye hazards described. All Friday will be devoted to eye hazards of industry, now the most prolific single cause of blindness. Another session will deal entirely with proper lighting, and the Saturday morning conference will be on sight-saving classes in the public schools. The technic in use in sight-saving classes will be described by teachers from these special schools in Cincinnati, Cleveland, Chicago, Columbus, Detroit, Seattle and New York. There will be a demonstration each day of the conference on testing the vision of children under school age, and demonstrations of sight-saving classes will be held in the schools of Chicago. The final session, Saturday afternoon, will consider trachoma as a public health problem. The organizations participating in this conference will be the Chicago Ophthalmological Society, the National Safety Council, the Illinois Social Hygiene League, the Illuminating Engineering Society of America and the Conference of State and Provincial Health Authorities of North America.

INDIANA

Personal.—Dr. and Mrs. Joseph C. Reeder, Montezuma, celebrated their fiftieth wedding anniversary, August 14.——Dr. John S. Ragan, Plainfield, for many years physician to the Indiana Boys School, has resigned, effective, October 1, and Dr. John S. Spoor, Brooklyn, has been appointed to succeed him.——Dr. George J. Garceau, Chicago, has taken up the duties of chief resident physician at the Methodist Hospital, Indianapolis.——Dr. Charles B. Danruther has been appointed health officer of La Porte to succeed Dr. John Pracher; Dr. Danruther's place on the board of health will be taken by Dr. Charles E. Burleson.——Dr. Ulysses G. Powers, Albany, has announced his retirement from practice.

Clinical Lectures in Mental Medicine—No Charge.—A course in psychopathology is being given at the Central Indiana Hospital for Insane, Indianapolis, which is free to practitioners and students of medicine. Beginning September 17, the lectures occur weekly until Jan. 21, 1928, under the direction of Dr. Max A. Bahr, superintendent of the hospital. There is a course in social psychiatry which began September 15 and is continued once a week until December 8, under the direction of Dr. Joseph E. Kilman. Other courses in psychiatry, neurology and neuropathology are given during the second semester of the school year, beginning February 11, and a course for students and practitioners of law will be given at the hospital in the spring. There is an abundance of clinical material, a laboratory with several hundred gross neurologic specimens and several thousand microscopic sections, models, charts and photographs. The clinical files of the hospital, which are also accessible for teaching, contain records of more than 5,000 cases.

State Medical Meeting.—The annual meeting of the Indiana State Medical Association will be held, September 28-30, at the City Hospital, Indianapolis, under the presidency of Dr. Frank W. Cregor. Dr. Henry A. Christian, Boston, will address the general scientific session Thursday morning on "Diuretics in the Treatment of Cardiovascular Renal Diseases," and Dr. Edwin W. Ryerson, Chicago, on "Treatment of Common Bone Injuries." Following a luncheon at the hospital, there will be eight special dry clinics and demonstrations in the various operating rooms; then all sections will join in a general clinic addressed by Dr. William Mithoefer, Cincinnati, on "Nasal Accessory Sinuses and the General Practitioner"; by Dr. Julius Hess, Chicago, on "Infant Feeding," and by Dr. Robert Von Der Heydt, Chicago, on "Microscopy of the Living Eye" (lantern slides); Drs. William C. Moore, Muncie, and James Y. Welborn, Evansville, will hold a surgical clinic. The annual banquet will be at the Claypool Hotel, Thursday evening; Dr. Cregor will preside, and Dr. Morris Fishbein, Chicago, editor of THE JOURNAL, will give an address. At the general session, Friday, Dr. Hugh Cabot, Ann Arbor, Mich., will discuss "So-Called Catheter Cystitis, a Misnomer" and W. T. Bovie, Ph.D., Chicago, of the Council on Physical Therapy of the American Medical Association, will discuss "Physical Therapy." The golf tournament will be Wednesday afternoon at the Indianapolis Country Club, and that evening the state, district and county officers will have a dinner at the Atheneum, Michigan and New Jersey streets, where Dr. Fred C. Warnshuis, Grand Rapids, Mich., speaker, House of Delegates, American Medical Association, will speak on "County Medical Society Secretary—The Goat." The state medical frolic and smoker will follow this dinner. The ladies auxiliary has arranged for entertainment for the women.

MAINE

Society News.—The annual outing of the Kennebec County Medical Society was held, September 5, at Belgrade Lakes; the day was devoted to sports; there were golf tournaments for the ladies and the men; tennis, swimming, boat races and fishing contests with prizes for all events. There was a dinner in the main dining room of the Belgrade, a moving picture called "The Gift of Life," and dancing. The general committee in charge of the outing comprised Drs. Frederick T. Hill, Waterville, George R. Campbell and Warren B. Sanborn, both of Augusta.

MARYLAND

Society News.—A group of members of the surgical section of the Royal Society of Medicine of England visited the Johns Hopkins Hospital and School of Medicine, September 15, and were guests at a luncheon, tea and dinner at the Baltimore City Club. A committee of well known physicians entertained the visitors, who were on a tour of the medical centers of Canada and parts of the United States. They came to Baltimore from Cleveland and proceeded to Washington, and then to Philadelphia, New York and Boston. Dr. Charles Max Page, honorary secretary of the surgical section, and surgeon to St. Thomas' Hospital, London, was in charge of the party.

Birth Control Clinic Operated by Physicians.—Dr. John Whitridge Williams, professor of obstetrics, Johns Hopkins University School of Medicine, Baltimore, announces that a birth control clinic, supported by prominent physicians and others, will be opened this fall or winter on Broadway near the Johns Hopkins Hospital. It will differ from birth control clinics in most places in that propaganda will not be dispensed, and persons will not be accepted unless sent to the clinic by a physician. It will be purely an association of medical men, and will be operated by them. Dr. Bessie

L. Moses will be in charge. Dr. Moses is a graduate of Johns Hopkins and an extern at the Johns Hopkins Hospital, and was formerly connected with the Woman's Hospital in Philadelphia. Among those interested besides Dr. Williams are Dr. William H. Howell, director, Johns Hopkins School of Hygiene and Public Health; Dr. Adolf Meyer, professor of psychiatry, and Raymond Pearl, Ph.D., director of the institute for biologic research.

MICHIGAN

Personal.—Dr. and Mrs. Victor C. Vaughan, now at Washington, D. C., celebrated their golden wedding anniversary in August. Dr. Vaughan for many years was dean, and is now professor emeritus, of hygiene and physiologic chemistry at the University of Michigan Medical School.

"Dr." Jackson's Checks Returned.—A man, giving the name of Dr. C. R. Jackson, 1202 Marshall Field Annex Building, Chicago, recently called on several clinical laboratories in Detroit requesting an examination of his urine, for which he presented checks of from $12 to $15 on the Portage Park National Bank of Chicago, requesting he be given the difference in cash. Several of these checks have been returned because of no funds. There is no Dr. C. R. Jackson in the American Medical Directory. "Dr." Jackson is described as a tall, thin, red headed chap of about 27 years of age.

Report on Maternal Mortality.—In April, the state department of health, cooperating with the state medical society, began a study of deaths from puerperal causes during the last two years. A progress report appears in the *Journal of the Michigan State Medical Society*, September, showing that 113 deaths had been investigated up to June 30, 1927. The president of the state medical society had informed physicians throughout the state that the study was to be made, and a letter of introduction from him to physicians was carried by the investigator. The report indicated that only twenty of the 113 patients who died had had adequate prenatal care. Abortion was the direct or contributory cause in at least thirty-five cases, and, of the forty-seven cases of septicemia, twenty-eight followed abortion. The state commissioner considers that the proportion of abortions in the deaths thus far investigated is shocking.

Health Education by the State.—Three of the eight bureaus of the Michigan State Department of Health devoted their efforts almost entirely during the last fiscal year to educational activities. The director of the bureau of mouth hygiene, the most recently organized bureau, visited eighty-four communities, gave sixty lectures, held fifty-two conferences, and examined thirty-one groups of children to demonstrate the need of dental attention. The bureau of education gave 584 lectures during the year with an attendance of 61,005, most of whom were high school pupils. The bureau of child hygiene and public health nursing conducted classes in prenatal and infant care which were attended by 5,083 persons. Department nurses conducted classes for girls in infant care; the attendance was 55,042; these classes were carried on in the schools in ten counties; campaigns to stimulate breast feeding were conducted and calls were made on 1,141 young mothers.

MINNESOTA

Personal.—Lieut. Col. Roger Brooke, Jr., U. S. Army, gave a series of three lectures on tropical diseases at the Mayo Clinic, Rochester, beginning September 13.——Dr. Norman W. Crisp has been granted leave of absence from the Mayo Clinic to return to Dartmouth to coach football.——Dr. Marguerite J. Scholl has been assigned to Dr. Helmholz's service as a fellow in pediatrics at the Mayo Clinic.——Dr. Ruth E. Boynton, Minneapolis, for years director of the child hygiene division of the state department of health, has taken a position on the faculty of the University of Chicago Medical School, effective, October 1, and will also serve in the student health service of the university.

Society News.—Dr. Frank J. Hirschboeck, Duluth, was elected president of the Northern Minnesota Medical Association at the recent meeting in St. Cloud. The next annual meeting will be in Fergus Falls.——The old building of the former Minneapolis College of Physicians and Surgeons at Seventh Avenue S and Fifth Street, Minneapolis, was razed in September to make way for a large building for a commercial concern.——The annual meeting of the Southern Minnesota Medical Association, Austin, September 30-October 1, opened with the presentation of cases for about two hours. Dr. Winford P. Larson, professor of bacteriology and immunology, University of Minnesota Medical School, read a paper on "Malta Fever"; Dr. Robert G. Green, assistant professor of bacteriology, University of Minnesota Medical School, on "Tularemia in Minnesota"; Dr. John Jay Keegan, dean, professor of chemical pathology and instructor in surgery, University of Nebraska College of Medicine, Omaha, "Trends in Medical Education and Medical Practice"; Dr. Howard L. Beye, professor of surgery, State University of Iowa College of Medicine, Iowa City, "Ununited Fractures of the Tibia"; Dr. William L. Benedict, Mayo Clinic, Rochester, "Foreign Therapy in Ocular Diseases," and Dr. Herman J. Kooiker, Albert Lea, "Diathermy and Physical Agents in General Practice." At the banquet, Dr. Henry T. McGuigan, Red Wing, president of the society, was toastmaster, and among the speakers were Dr. William J. Mayo and Dr. Hilding Berglund.

MISSOURI

Alumni Dinner.—The third annual dinner of the Ensworth-Central Medical College Alumni Association will be at St. Joseph, October 22, at the close of the postgraduate week in Kansas City. Clinics will be held all day Saturday in St. Joseph hospitals. All graduates of Northwestern, Ensworth-Central Medical colleges, and the professors in the three colleges are urged to attend. The secretary is Dr. Charles W. Fassett, 115 East Thirty-First Street, Kansas City, Mo.

NEW JERSEY

Society News.—A woman's auxiliary of the Medical Society of New Jersey was organized in Atlantic City, in June, by Mrs. William Wayne Babcock, Philadelphia, who represented the national woman's medical auxiliary at the organization meeting. Mrs. A. Haines Lippincott, Camden, was elected president and Mrs. Aaron L. Stillwell, Somerville, secretary.

Personal.—Dr. Lee E. Griscom is director of the new $250,000 Marion Childs Hospital recently opened at Camden.——Dr. Raphael Gilady has resigned as pathologist to the Hackensack Hospital.——Dr. Samuel Cochran assumed the duties of medical director of Lawrenceville School, September 1; Dr. Cochran for many years was engaged in hospital work in China.——Dr. Edward M. Z. Hawkes is the new medical director of the Presbyterian Hospital, Newark, N. J., succeeding Dr. Samuel E. Robertson, resigned, who held that position for about twelve years; Dr. Robertson was appointed medical director emeritus.——About 200 friends and colleagues attended a dinner, September 22, at Jersey City in honor of the completion of twenty-five years in practice by Dr. Abdon V. Piskorski.

Reunion of Former Patients.—About 700 former patients, physicians, nurses, welfare workers and others attended the twentieth anniversary of the opening of the New Jersey State Sanatorium for Tuberculous Diseases, Glen Gardner, September 17. Following a buffet luncheon served at the sanatorium, Dr. Samuel B. English, superintendent, presided at an assembly in the recreation hall. The speakers were Commissioner William J. Ellis, department of institutions and agencies of the state; Dr. A. C. Morgan, Philadelphia, president-elect of the Pennsylvania State Medical Society, Dr. Harry A. Pattison, Livingston, N. Y., and Mr. D. C. Bowen of the New Jersey State Board of Health. A gold watch and chain were presented to Dr. English on behalf of the patients and staff to commemorate his twentieth anniversary as superintendent.

NEW MEXICO

Personal.—Dr. Arthur M. Washburn, health officer of McKinley County, has accepted a similar position in Arkansas, and Dr. Glen A. Sheppard of Doña Ana County has been appointed to succeed Dr. Washburn on a part-time basis.

Hospital News.—A 110 bed hospital is under construction at the United States Indian School at Alberquerque and will be completed about April 1, 1928, replacing the old forty bed hospital; the new one will be modern in every respect. A nurses' training school for Indian girls was opened here in September.

More Infantile Paralysis—Provision for Treatment.—A total of 123 cases of infantile paralysis was reported to the state department of health between June 26 and September 20. On the latter date, however, it was said that not more than twenty cases were in isolation. The governor has approved a request from the state board of public welfare for authority to borrow not more than $4,000 to be used in providing treatment for persons paralyzed by this disease, and although the survey being made by the state board is not complete,

it is estimated that about seventy-five will require treatment. A trained worker has been engaged to come to New Mexico for not more than six months to treat these cases under the supervision of the family physician, and to teach nurses the methods, so that the treatments can be continued. Families who are able will be asked to pay a reasonable fee, and the funds collected in this way will be deposited in the state treasury to offset the cost of the service.

NEW YORK

Personal.—One of several cottages dedicated, August 21, at the Chautauqua County Tuberculosis Hospital was in memory of the late Dr. John J. Mahoney,. who had been active in health work in the county for many years.——Dr. Ebba E. A. Dederer has been appointed full-time health officer for the public schools of Watertown.

Society News.—The September meeting of the Buffalo Academy of Medicine was addressed by Dr. William G. Morgan, Washington, D. C., on "Etiologic Factors of the So-Called Spastic Gut"; Dr. Abraham J. Rongy, New York, on "Some Phases of Sterility," and Drs. George J. Eckel, Kenneth G. Mowat and Walter H. Krombein, all of Buffalo, on "Evaluation of Renal Function Tests."——The Medical Society of the County of Erie was addressed, September 19, by Dr. Frances M. Hollingshead, Buffalo, on "Findings of a Five Year Study of Infant Mortality in Buffalo."——The midyear meeting of the New York State Association of Public Health Laboratories will be held at Albany, November 4.

New York City

Kings' County's Practical Lectures.—The usual fall series of ten lectures given by the Medical Society of the County of Kings will be opened, October 7, by Dr. Walter C. Alvarez, Rochester, Minn., who will discuss "The Human Stomach." The program has not been fully arranged yet. Others who have accepted are Drs. Arthur C. Christie, Washington, D. C.; Hugh H. Young, Baltimore, who will speak October 17, and Douglas Quick, New York.

Columbia Opens Last Year in Old Medical Building.—Columbia University began its one hundred and seventy-fourth academic year, September 28, and Dr. Francis Carter Wood, director of the institute of cancer research, delivered the annual address on "Durable Satisfaction of Science," and Nicholas Murray Butler, LL.D., president of the university, presided. At the opening of Columbia University College of Physicians and Surgeons, Dr. Benjamin P. Watson, professor of obstetrics and gynecology, gave an address on "Preparation for the Practice of Medicine." It has been announced, definitely, that the medical instruction will be transferred to the new medical center at One Hundred and Sixty-Eighth Street and Broadway next fall.

Personal.—Dr. Ian MacKenzie of Scotland sailed from New York, September 17, for Guayaquil, Ecuador, where he is to assume charge of the new hospital and school of medicine called "Ninth of October," in commemoration of the day on which Ecuador gained its independence.——Sir Thomas Oliver sailed for England, September 17, after a short visit to study progress in this country in industrial medicine.——Sir Charles Sherrington, professor of physiology, Oxford University, England, will address the section of neurology and psychiatry, New York Academy of Medicine, October 25. The academy will open its scientific season, October 6, when Edgar Sydenstricker, Washington, D. C., will discuss the "Prevalence of Disease"; Louis I. Dublin, Ph.D., Metropolitan Life Insurance Company, "The Cost of Medical Service," and Dr. Leland E. Cofer, director, New York State Bureau of Industrial Hygiene, "A Campaign for Health and Safety in Industry," illustrated by motion pictures.——Dr. Alexis Carrel, Rockefeller Institute for Medical Research, returned from his annual summer vacation in France, September 21.

OHIO

Personal.—Dr. Edgar R. Hiatt, formerly of Shawnee, has assumed the duties of health officer of Logan and Hocking County.——Dr. Harry M. Schuffell has given his home at Canton to the Sisters of Charity of St. Augustine for a children's hospital, it is reported.——Dr. Eldred V. Thiehoff, Bolivar, Mo., has taken up his duties in the health department of the city of Akron, succeeding Dr. Carrie A. Herring, who has been granted a year's leave of absence to take advantage of a scholarship awarded by the Rockefeller Foundation.——Dr. George D. Lowry, who for many years was in charge of the Methodist Hospital in Peking, China, has been appointed university physician in charge of the student hospital at Ohio Wesleyan University, Delaware; since his return to this country in 1926, Dr. Lowry has been practicing in Lakewood.——Dr. Arthur B. Gruver has presented to the library of the Toledo Academy of Medicine bound volumes of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for the last four years.

Symposium on Feelings and Emotions at Wittenberg College.—Members of the American Medical Association are invited to a symposium on feelings and emotions to be held at Wittenberg College, Springfield, Ohio, October 19-22. About twenty well known scientists in this country will participate, and papers from several European countries will be read by proxy, including those by Janet, Paris, on "Fear of Action as the Essential Element in the Sentiment of Melancholia," and by Krueger, Leipzig; Alfred Adler, Vienna; William Stern, Hamburg; Grotenfelt, Finland; Joergensen, Denmark; Gruehn, Lithuania, and Kiesow, Turin. Among the subjects to be presented by the American speakers will be the rôle of feelings and emotions in esthetics; neural organization for emotional expression; utility of feelings and emotions; the place of emotion in modern psychology, and pleasantness and unpleasantness as modes of bodily experience. The head of the psychology department at Wittenberg College is Martin L. Reymert, Ph.D., who will give further information on request.

Chiropractors Try to Go Over Heads of Legislators.—After having been refused a separate board of examiners by the state legislature, the chiropractors in the face of this defeat have forced an initiated bill before the voters at the November election. This bill would grant chiropractors who have had eighteen months or less of school authority to practice in hospitals and in state institutions, to treat contagious diseases and to practice under the Workmen's Compensation Law. There is no need for this legislation for, at the present time, a chiropractor has the privilege of taking an examination in chiropractic subjects before a committee of licensed chiropractors appointed on recommendation of the Licensed Chiropractors Society of Ohio. A number of chiropractors take this examination each year, and those that pass are duly licensed to practice. It is said to be those who are unable to pass this examination, or those who fear such examinations that are now demanding a separate board. The courts have repeatedly declared the present licensing laws and administration to be correct and just.

OREGON

State Medical Election.—At the annual meeting of the Oregon State Medical Association, recently, at Salem, Dr. Hugh S. Mount, Oregon City, was elected president, and Dr. Frederick D. Stricker, Portland, was reelected secretary. The next meeting will be held at Portland, 1928.

Society News.—Dr. James W. Sherrill of the Scripps Metabolic Institute, La Jolla, Calif., addressed the Lane County Medical Society, Eugene, August 15, on diabetes.——At a dinner meeting, August 15, about twenty-nine physicians considered the organization of the staff of the Columbia Hospital, Astoria. A committee was appointed to make plans for a permanent staff. The committee comprises Drs. Anson G. Allen and Lansford M. Spalding and Rev. A. Anderson, superintendent of the hospital.

PENNSYLVANIA

Gift for Study of Medical Physics.—Eldridge R. Johnson, formerly president of the Victor Talking Machine Company, has given $800,000 to the University of Pennsylvania to establish the Eldridge R. Johnson Foundation for Research in Medical Physics. Not more than $200,000 of the total will be expended for building and equipment; the income from the balance will be used for the "study and development of physical methods in the investigation of disease and in its cure; for the study of the important physical agencies or properties such as heat, light, electricity, sound, in their varied relations to the life of man, and to carry out investigations for the improvement of the instrumental applications of such agencies to medical purposes." This, one of the largest single gifts ever made to the university, makes the total in the present campaign for funds thus far $10,000,000. Dr. Alfred Stengel, professor of medicine at the university and chairman of the medical campaign for funds, stated that the Eldridge R. Johnson Foundation will be attached to the medical clinic of the university hospital as a part of the far-reaching program of development. Dr. Joseph H. Penniman, provost of the university, stated that the gift means a great step forward in the plans for medical development at the university; in a practical way, he said, it will have as one

of its purposes the scientific determination of the real value which may attach to a great variety of physical methods used in the study and especially the treatment of disease. Some idea of the range of studies that will be carried on in the new foundation may be gained from the fact that the plans call for six laboratories, each having a definite field of activity. They will be: 1. A laboratory for studies in light and optics, including investigations relating to sunlight, mercury-quartz lamp rays and infra-red rays. Radium emanations, roentgen rays, and highly related topics in this field also will fall under this division. 2. A laboratory for studies of the effects of heat, including the biologic aspects and the practical bearing of heat on problems of disease and its treatment. 3. A laboratory for studies in sound and audition, including the investigation of hearing and the application of instrumental methods for improving human hearing. This laboratory also will conduct studies in the reproduction of sounds (heart-sounds and the like), and in the physical effects of sound. 4. A laboratory for the determination of physical measurements — for studies of movements in the human body such as heart action, movements of the stomach and intestines, the flow of blood, and the intake and output of air. 5. A laboratory for photographic and cinematographic study of bodily processes and conditions. 6. A laboratory for the study of electricity in its relation to the diagnosis and treatment of disease.

SOUTH CAROLINA

Pellagra Increased Last Year.—In accounting for the increase in the death rate of South Carolina in 1926 over that of 1925 from 1,219 to 1,282 per hundred thousand of population, the U. S. Department of Commerce notes that the death rate from pellagra increased from twenty-four to thirty-one. Increased death rates were also noted for diseases of the heart from 134 to 149; influenza, from forty-eight to sixty-two, and pneumonia, from seventy-seven to eighty-eight.

Postgraduate Courses Well Attended.—The registration for the postgraduate courses for physicians which the Medical College of the State of South Carolina gave, September 12-26, amounted to 138, including some physicians from North Carolina, Georgia and Florida. In addition to lectures, clinics and demonstrations through the day by the faculty of the college, arrangements were completed for evening lectures, the first of which was by Dr. Joseph C. Bloodgood, Baltimore; the second by Dr. Frank H. Richardson, Brooklyn, and others by Drs. William de B. MacNider, Chapel Hill, N. C.; Oren Moore, Charlotte, N. C., and William Weston, Columbia. The subjects stressed in this postgraduate course were pediatrics, internal medicine and obstetrics.

UTAH

State Medical Election. — At the annual meeting of the Utah State Medical Association, recently, Salt Lake City, Dr. Eugene H. Smith, Ogden, was elected president, and Dr. Frank B. Steele, Salt Lake City, was reelected secretary. The next meeting will be held at Ogden in 1928.

WASHINGTON

State Medical Election. — At the annual meeting of the Washington State Medical Association, Tacoma, August 29-31, Dr. Richard J. O'Shea, Seattle, was elected president succeeding Dr. Harry G. Willard, Tacoma; Dr. Frederick H. Brush, Yakima, first vice president; Dr. Curtis H. Thomson, Seattle, secretary-treasurer; Dr. Frederick Epplen, Spokane, delegate to the American Medical Association, and Dr. Peter D. McCornack, Spokane, alternate. The next annual meeting will be in Seattle.

Quack R. S. Hagen Arrested.—Investigations by the Tacoma Better Business Bureau, in cooperation with the state department of licenses, have culminated in the arrest of "Dr." R. S. Hagen, 3104 North Nineteenth Street, Tacoma, on a charge of practicing medicine without a license. It seems that Hagen claims to be a graduate of an institution that formerly operated as a "diploma mill" in Seattle. Presumably, R. S. Hagen is Rose S. Hagen, who used to pass as a "sanipractor" in Puyallup, Wash. In July, 1926, the supreme court of the state of Washington sustained the revocation of the license of this woman. The court is reported to have stated that the evidence in the case of Rose S. Hagen showed conclusively that the license that she procured was obtained by the practice of the grossest fraud. It seems that Rose S. Hagen represented herself to be a high school graduate and to have attended a recognized school for three sessions of thirty-six weeks each. As a matter of fact, she had no high school education, and got her "diploma" from the egregious American University of Sanipractic in Seattle. Incidentally, a testimonial by Rose S. Hagen is used by a quack concern, M. B. Marcell of Portland, Ore., in exploiting "Marcell's Miracle Mineral."

WISCONSIN

Society News.—Dr. William P. Murphy, Boston, addressed the University of Wisconsin Medical Society, September 26, Madison, on "Dietetic Treatment of Pernicious Anemia."

First Unit of Hospital Dedicated.—The opening of the new Methodist Hospital, Madison, was celebrated, September 15-18, by exercises in the assembly chamber of the state capitol on the first day; the governor of Wisconsin, the mayor of Madison, and Dr. Reginald H. Jackson, chief of staff of the hospital and with whose clinic the hospital is affiliated, participated. The principal addresses were given by Glenn Frank, LL.D., president of the University of Wisconsin; Bishop William F. Anderson, Boston, and Dr. Franklin H. Martin, Chicago. The following day a scientic program was presented at the hospital; among the speakers were Dr. William D. Stovall, Madison, "Fungus Infections of the Respiratory Tract," and Dr. Arthur W. Rogers, Oconomowoc, "Diagnosis of Various Psychoses"; following a dinner, Dr. Willy Meyer, New York, spoke on "Personal Reflections on the Evolution of Medicine and Surgery in the Last Fifty Years"; Dr. Alfred W. Adson, Mayo Clinic, Rochester, Minn., "Cervical Ribs," and Dr. Bernard H. Nichols, Cleveland Clinic, Cleveland, "Problems in Urography." The new seven story building is the first of four units; when the three wings are added, it will be shaped like a cross, thus permitting a maximum amount of light. The house physicians have quarters in the tower on the seventh floor, where there is a panoramic view of the four lakes region.

GENERAL

Organization Changes Name.—The National Committee for the Prevention of Blindness will change its name, Jan. 1, 1928, to the National Society for the Prevention of Blindness.

Liquor Prescriptions Must Be Filled Within Three Days.—New regulations announced, September 24, by the prohibition bureau, Washington, D. C., provide that a prescription for liquor must be filled within three days after it is issued unless the physician extends the time not to exceed an additional three days. Another new regulation requires that prescriptions in which potable distilled spirits are used may not be written or filled for a gross quantity in excess of 6 fluid ounces. These changes become effective, October 1.

Society News.—At the thirty-second annual meeting of the American Academy of Ophthalmology and Oto-Laryngology, September 12-16, Dr. Luther C. Peter, Philadelphia, was installed as president; Dr. Harris P. Mosher, Boston, was made president-elect; Drs. Frank L. Dennis, Colorado Springs, Lawrence T. Post, St. Louis, and Hermon H. Sanderson, Detroit, vice presidents; Dr. William P. Wherry, Omaha, executive secretary; Dr. Secord H. Large, Cleveland, treasurer, and Dr. Clarence Loeb, Chicago, editor of the transactions. The next annual meeting will be held in St. Louis in October, 1928.——Dr. Palmer Findley, Omaha, was elected president of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons at the annual meeting in Asheville, N. C., September 18; Drs. Charles Gordon Heyd, New York, and William W Babcock, Philadelphia, vice presidents; Dr. James E. Davis, Detroit, secretary, reelected, and Dr. Lewis F Smead, Toledo, Ohio, treasurer. The next annual meeting will be in Toronto, Canada.

Parent-Teacher Associations.—A review of the activities of parent-teacher associations in several states has been made by the U. S. Department of the Interior. In South Carolina, it is said, they are regarded as welfare units caring for the needy, serving free lunches, holding many clinics and accomplishing much in the way of health education. In South Dakota, parent-teacher associations stress welfare work and the education of parents and health clinics; health and thrift

have been stressed in Texas where the college parent associations are on the increase. Utah stresses many ways of child welfare work. At the University of Virginia, six week credit courses in parent-teacher work are given, and at William and Mary College, three week courses are given. The West Virginia State Health Department cooperates with the parent-teacher work, stressing parental education and study circles. In Wisconsin, the parent-teacher associations are trying to spread health information and are cooperating with the county nurses in holding preschool clinics. The Milwaukee District and the Fourth District associations have a fund to enable physically handicapped children to attend school.

Last Fourth of July Celebration Not So Sane.—The president of the American Museum of Safety has completed a survey in more than 600 cities in forty-three states to determine the number of injuries resulting from the Fourth of July celebration this year. It was found that 195 deaths and 3,179 injuries resulted from the celebration. Among the killed were thirty-one children under 6 years of age and 122 persons between 6 and 20 years of age; forty-eight of the victims were burned, their clothing having been ignited by so-called harmless fireworks; blank cartridges caused forty-six deaths; firecrackers, twenty-two, and the eating of fireworks by small children, sixteen. New York led the states in the number of deaths with thirty-six; then came Pennsylvania, thirty-four; Illinois, twenty; New Jersey, fifteen; Indiana, eleven; Massachusetts, ten; California, nine; Missouri, eight, and Texas, two. In commenting on the results of the survey, Arthur Williams, president of the American Museum of Safety, says that a repetition of these fatalities will occur unless strong precautions are taken to prevent them, and that instruction in the prevention of accidents such as these should be made a part of the curriculum of every school.

Deaths in Other Countries

Adrian Stokes, London, England, authority on tropical diseases, at Lagos, West Africa, of yellow fever while conducting researches for a yellow fever commission.

Government Services

Army Personals

Lieut. Col. John A. Clark has been relieved from duty at Fitzsimons General Hospital, Denver, and has been assigned to the One Hundred and Twenty-Eighth Medical Regiment, One Hundred and Third Division, with station at Denver, and his name is placed on the detached officers list; Lieut. Col. William R. Davis, having been found incapacitated for active service on account of disability incident thereto, his retirement has been approved by the President.——Capt. Benjamin W. Lewis, Medical Corps, has been relieved from duty at Kelley Field, Texas, effective on or about September 5, and ordered to proceed to Fort Sam Houston, Texas, to report to the commanding officer for duty.——Major John Edward Walker, Medical Corps, has resigned as an officer of the army, effective, September 20.——Major Samuel R. Norris, Medical Corps, has been assigned to duty at Fort Monroe, Virginia, effective on the completion of his present tour of foreign service.——Major Edgar S. Linthicum, Medical Corps, has been relieved from duty at Camp Meade, Maryland, and assigned to duty at the Medical Research Laboratory, Edgewood Arsenal, Maryland.——The appointment and assignments of the following Medical Corps officers have been announced: John Winchester Rich, Eagle Rock, Calif., to Letterman General Hospital, Presidio of San Francisco; Thomas Brown Murphy, Peterson, Iowa, to Army Medical School, army medical center, Washington, D. C.; Huston J. Banton, Mount Zion, Ill., to Army Medical School, army medical center, Washington; Hervey Berson Porter, Los Angeles, to Fort McDowell, California.——Major Albert H. Eber, Fort Totten, N. Y., has been ordered to his home to await retirement; Major Eber has been under treatment at the Walter Reed General Hospital.——Capt. Thomas G. Tousey is relieved from duty at Fort Leavenworth, Kansas, and will sail from New York about October 7 for the Philippine Islands for duty.——Capt. John R. Oswalt has been assigned to duty at Fort Lincoln, North Dakota.——Capt. Royal S. Loving will accompany the Sixth Engineers by marching from Camp Lewis to Fort Lawton, Washington, reporting on arrival to the commanding officer for duty.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 10, 1927.

The Declining Birth Rate

The birth rate in England and Wales has now fallen below that of France, and, excepting Sweden, is the lowest of the principal European countries. This statement is contained in the statistical review of the registrar-general for 1926. The birth rate for 1926 was 17.8 per thousand of population. Excepting the rate of 17.7 in 1918, the last year of the war, which at that time was regarded as phenomenally low, that for 1926 is the lowest recorded since the establishment of civil registration in this country. In view of the continued decline during the first half of the current year, it is probable that the rate for 1927 will be lower than that for 1918. The crude death rate was 11.6 per thousand of population, and was equal to that of 1923, the lowest on record. In 1924 and in 1925 the rate was 12.2 per thousand. The death rate from cancer was 1,362, or 26 per million higher than in 1925, and was the highest rate yet recorded. The suicides from poisonous gases, practically all of which were from coal gas, have shown a substantial increase in recent years, from 165 in 1917 to 943 in 1926. The general death rate and the infantile mortality are low compared with the rates prevailing in most of the other countries.

The Compulsory Treatment of Venereal Disease in New South Wales

The director-general of public health in New South Wales has issued an important report on the working of what appears to be the most drastic attempt made by any government to grapple with the problem of venereal disease. When a patient applies to a physician for treatment the latter is bound to notify the fact, but notification is by number and not by name, unless the patient fails to continue under treatment until cured, when the physician is required to report his name and address to the commissioner, who is a physician. The patient is then informed of the penalties which he incurs unless he resumes treatment. In practically all cases in which a patient can be reached, he resumes treatment. It has been seldom necessary to resort to prosecution. There is a difficulty in following up defaulters because of the large number who give a false name and address. In 1925, 955 persons were notified for failing to continue treatment. Of these, 538 could not be traced for the reason given; 241 resumed treatment and 176 were under investigation at the end of the year. The advertisement of remedies for venereal disease is forbidden; treatment must be by physicians only. A person suffering from such a disease must within three days of becoming aware of his condition consult a physician, to whom he must furnish his correct name, occupation and address and to whom he must submit himself for treatment. Disobedience is punishable by a fine not exceeding $500 or imprisonment for three months. There is a provision for secrecy. A physician who otherwise than when required by the act discloses the condition of the patient is liable to a penalty not exceeding $500 and shall be deemed guilty of professional infamous conduct. Marriage by a patient suffering from venereal disease in an infectious stage is an indictable offense punishable by a penalty of $2,500 or five years hard labor or both. If a physician has reason to think that marriage is intended he may inform the other party, the parent or guardian or the commissioner. Patients (or, in the case of children, their parents) are to be warned of the dangers of contagion. It is an offense to work in a shop,

factory, hotel or restaurant when suffering from venereal disease. To infect any one knowingly is punishable with a fine of $500 or twelve months' imprisonment or both. Brothel keepers commit an offense if they knowingly allow the presence of a female patient, and certificates of cure or freedom from disease must not be used for prostitution.

A New Type of Englishman

At the meeting of the British Association for the Advancement of Science, Dr. F. G. Parsons, professor of anatomy in the University of London, in his presidential address to the Section of Anthropology, discussed the trend of change in the modern Englishman. Some of the characteristics of the Englishman of today, he said, do not seem to be hereditary at all, and in some things we, in our development, are not following any mendelian laws; nor are we harking back to Long Barrow, Bronze Age, Celtic, or Saxon types, but gradually we are building up a new kind of man, differing in certain ways from all these. During the last fifty years there has been a steady and rational interest in hygiene, particularly in relation to the care of the young. In each year the younger generation is brought up a little more sanely than its forerunner; and each year, too, the more healthful influences push their way a little lower into the social scale. Now we have reached a stage in which the poorest child of the slums may be, and often is, watched over by the child welfare and almoners' departments of our great hospitals long before it is born, and if its parents are not too stupid, may, throughout its young life, enjoy very nearly the same healthful surroundings and quite as much skilled medical advice as its richer brethren, save that we cannot yet give it the amount of air it needs in which to sleep healthily, or free it from the results of the ignorant and thoughtless cruelty of uneducated parents. The result is a perceptible improvement in the physique of children. In the London schools Dr. Parsons has found that even in the poorest districts the children are, on the whole, cheerful and fairly healthy. He also has found changes in our population. The average height of the modern English working classes might be taken as 5 feet 5 inches. The average of the well nourished classes is higher. In no single year in the last twenty years has the average of the medical students at St. Thomas's Hospital been less than 5 feet 9 inches. Hygiene and better nutrition have undoubtedly raised the height of better-class Englishmen, and it had now probably reached the average limit to which the Nordic race could attain. Dr. Parsons found that the height of women also appeared to be increased. Twenty years ago the average height of 150 students at the School of Medicine for Women was 5 feet 3 inches. After ten years he found the average raised by a fraction of an inch. This year he had measured 150 nurses and massage students at St. Thomas's and found an average of 5 feet 5 inches. With regard to color, he controverted a current popular notion that the English race was becoming darker. Dealing with both the hair and the eyes, his observations and analyses of the work of others showed that there was a definite increase in fairness, particularly with regard to the hair.

Turning to the shape of the head, Dr. Parsons said that in the familiar measurements which divided persons according as they were round headed, medium, or long headed, no account was taken of the height of the skull. The length and breadth by themselves did not give any indication of the most important point, the capacity of the skull and size of the brain. From a large series of measurements he gave, he was able to show that although the width and the breadth had altered very little from the oldest known British skulls, the height and the brain capacity had definitely increased.

In conclusion, Dr. Parsons believed that the Englishman of the future is making for an average height of 5 feet 9 inches and the women for one of 5 feet 6 inches or 5 feet 7 inches. Our people have reached, and are stationary at, a stage in which 66 per cent have light eyes and 34 per cent dark. There are no signs that the hair color has darkened during the last sixty years, though there are signs, which perhaps need discounting, that the hair is lighter than it was sixty years ago. The shape of the head is showing signs of an increase of its proportional height, with a decrease of its proportional length, and this increase of proportional height is greater than has been found in any of the stocks from which the modern Englishman is derived. It therefore cannot be looked on as a harking back to any ancestral form, but must be regarded as an evolutionary process, in harmony with the greatly changed conditions of life which have come about during the last century. It follows that there will be greater difficulty in determining whether the modern Englishman has more Saxon, Neolithic, Alpine or Iron Age blood in his veins; and we must realize that he is becoming an individual who could not be formed by any possible combination of these stocks without the aid of external influences. Heredity alone, therefore, will not account for the Englishman of the future.

Requirements of the Population in Milk Fat (Vitamin A) and the Available Supply

In the Section of Physiology, Dr. William Cramer of the Imperial Cancer Research Fund submitted a paper on the requirements of the population in milk (vitamin A) and the available supply. He said that all the evidences bearing on the requirement of milk fat in the diet led to a minimal figure of from 40 to 50 Gm. a day, or, in ordinary terms, a glass of full milk and an ounce of butter. On this basis he calculated the yearly requirements of milk fat and also the supply available for the population of this country.

Requirements:
Consumption of milk fat per person daily, from 40 to 50 Gm.
Total yearly requirements of population (43 millions), from 628,000,000 to 785,000,000 Kg.

Available Supply:
Home milk production, 1,350,000,000 gallons = 6,142,000,000 liters = 6,327,000,000 Kg.
Imported butter, 268,000,000 Kg.
Imported milk fat, 227,000,000 Kg.
Total milk fat available, 480,000,000 Kg.
Available, if rationed, 30 Gm. per person daily.

Deficit:
Deficit of available milk fat, from 148,000,000 to 305,000,000 Kg.

The deficit shown of available milk fat was considerable. The milk fat available, if rationed equally, would give only 30 Gm. per head of the population. Since a large part of the population consumed its ideal minimal quota of from 40 to 50 Gm. and a smaller part even exceeded it, another large part of the population had a consumption of only 20 Gm. of milk fat or even less. Only half of the available milk fat was produced at home; the other half was imported. The countries mainly responsible for the imported supply were Australia and New Zealand, which supplied one third, and Denmark, which supplied another third. As far as Denmark was concerned, the export of milk fat did not represent a surplus; the Danish people were starving themselves of milk fat in order to export it. Butter was not merely twice as valuable as margarine but was irreplaceable by it so long as the minimum requirements of milk fat have not been covered. That is to say, margarine could replace butter after the minimum daily requirements of from 40 to 50 Gm. of milk fat have been supplied. We were suffering from a world shortage in the production of milk, and, if the conditions in Denmark may be taken as a guide, this shortage has been becoming increasingly acute during the last twenty years.

Whether Dr. Cramer is right or wrong in stating that we are generally suffering from a shortage of vitamin A, he seems to overlook the fact that the vitamin occurs—in smaller

proportions than in butter it is true—in milk, eggs, meat fat and vegetables. Dr. W. H. Wilson, writing in the *Times*, states that the daily consumption of 6 or 7 ounces of vegetables, particularly green leafed (cooked or in salads), would provide a sufficiency not only of vitamin A but also of the other vitamins. In some investigations which he recently carried out in Egypt, he found that the liver fats of sheep and oxen appeared to contain about 200 times the amount of vitamin A in butter.

PARIS

(From Our Regular Correspondent)

Aug. 30, 1927.

Honors to Roentgenologists

Recently M. André Fallières, minister of labor and public health, bestowed the cross of the Legion of Honor on a number of roentgenologists: M. Henri Bourdon, preparator at the Laboratoire central de radiographie at the Hôpital Saint-Louis, who, affected with radiodermatitis, was obliged to undergo serious mutilating operations; Dr. Caillods, head of the roentgenographic service at the Hôpital St. Jacques at Besançon, and physician to the antituberculosis dispensaries of the Office d'hygiène sociale, who suffered the amputation of two fingers; Dr. Degouy, head of the roentgenographic service at the Hôtel-Dieu at Amiens, who, following the amputation of a finger, lost the use of one hand; Dr. Lacaille, one of the oldest roentgenologists of Paris, affected with pernicious anemia due to the action of roentgen rays, and Dr. Paschetta, director of the roentgenographic services in Nice, who suffered severe burns of the right hand and lower limbs.

Extension of the University City

The so-called Cité Universitaire, or University City, was founded through the gifts of M. Emile Deutsch of Meurthe, to which donations from other sources have been added. In order to extend the University City still further, the city of Paris, on the recommendation of M. Deslandres, member of the municipal council, has ceded to the University of Paris a new parcel of land.

Gratuitous Medical Service

Gratuitous medical service constitutes a social question of great importance and one that interests not only the public authorities but also the medical profession. It becomes at times a heavy charge on a community, as may be seen, for example, by studying the situation in an agricultural section such as Orne. Recent statistics supply the following data: The number of persons registered as requiring help is 11,779, or 4.28 per cent of the population of the department. The total expenditures for the year 1926 were 1,481,543 francs, or about $60,000. Of this amount, 22.55 per cent was used to pay the fees of physicians, surgeons and midwives; 15.92 per cent went to the pharmacists; 61.20 per cent was paid for hospitalization and transportation, and 0.33 per cent covered the cost of administration and control. The average cost per patient aided at home ranged from 72 to 101 francs (from $3 to $4), which covers the cost of visits, consultations and pharmaceutic products. Of the various welfare services, the service providing gratuitous medical aid is one in which the high cost of living has made itself felt the most.

Special Service for the Prophylaxis and Treatment of Trypanosomiasis

A few months ago, a medical mission headed by Dr. Louis Tanon, agrégé professor at the Faculté de médecine of Paris, secured evidence concerning the action of the drugs recommended in trypanosomiasis. Regularly physicians are sent to organize the forms of treatment and prophylaxis against the disease. A personnel comprising ten French physicians is engaged for a period of five years. The five years consist of two colonial periods of twenty-four months each, to be spent in French Equatorial Africa, and are separated by a leave of absence of six months in France, which is needed by Europeans who have spent some time in hot climates. The physicians are obliged to spend a term in a special service of the Pasteur Institute in Paris.

Attempts to Eliminate Squalid Dwellings

Some time ago, Madame Georges Leygues, wife of the minister of the marine, founded a society called the Ligue nationale contre le taudis [squalid lodging]. This praiseworthy society has already accomplished good results. The only proper solution would be to replace the wretched lodging by *"cités sociales"* containing plain but substantial dwellings. An appeal issued by M. Claude Pierrey asks that the municipality of Paris, the central government, the large industries and philanthropic individuals shall take an interest in the work.

A Legacy of $800,000 to the Pasteur Institute

The Pasteur Institute has received a legacy of twenty million francs, or $800,000, from a French physician, Dr. René Marius Appert of Paris, who died at the age of 65 at San Remo, on the Italian Riviera. In addition, the decedent bequeathed 200 securities of the Crédit Foncier, of 500 francs each, to the Association des médecins et anciens internes des hôpitaux de Paris, his colleagues in Paris, and a further 200 securities of the Crédit Foncier to the antituberculosis society founded by Professor Grancher.

Tuberculosis Prophylaxis

Education of the public in health matters is one of the most effective means that can be employed against the spread of tuberculosis. In particular, patients must be taught how to take care of themselves and how to protect their entourage against contagion by taking certain precautions. Dr. Perreau has recently submitted to the General Council of the Seine a small work entitled "Vade mécum du tuberculeux," which he recommends having printed for the Department of the Seine and widely circulated as a form of publicity campaign to encourage tuberculosis prophylaxis.

BELGIUM

(From Our Regular Correspondent)

Aug. 19, 1927.

International Congress of Public Health

The International Congress of Public Health, which was organized at Ghent by the Royal Institute of Public Health of London, was opened under the chairmanship of the king of Belgium and the king of England. The congress comprised a section on state medicine and municipal hygiene, a section on naval, military, air and tropical diseases; a section on pathology, bacteriology and biochemistry, and a woman's section of public health.

Below is a brief summary of some of the more important communications:

PUBLIC HEALTH SERVICES IN THE FRENCH COLONIES

M. Abbatucci gave an account of the measures adopted in the French colonies to combat disease and factors causing depopulation. The protection of the man power employed in the tropics (Europeans, who are the technical advisers, and the natives, who are colaborers) is the primary duty of the health service. The French colonies (including the protectorates under the French flag) have an area almost equal to that of Europe, but they are inhabited by only 57,000,000 people, as compared with more than 400,000,000 in Europe. Comparison of these figures shows that the economic value of the colonies is a demographic problem to be solved only by the collaboration of the physician and the administrator.

The French possessions present widely different aspects and do not require the same sanitary treatment. The central authorities, therefore, confine their instructions to general directions and ask the directors and heads of services to study out on the ground the best plan of action.

On the other hand, the scarcity of European physicians has obliged the health service (1) to make greater use of the natives, and to develop the medical schools at Hanoï, Pondichéry, Dakar and Tananarive, which supply assistants in considerable number: physicians' aids or pharmacists, midwives, vaccinators, nurses, and the like; (2) to establish the so-called sanitary group and the mobile dispensary, which are veritable consultation groups on the march, to use a happy expression of Marshal Lyautey, and which make up, by their mobility, for the scarcity of physicians. They reach the most distant settlements, ferret out disease, and introduce some ideas of hygiene.

The crusade against the factors causing depopulation has been vigorously carried on: (1) in the form of campaigns to prevent stillbirths and lessen the child mortality rate by the creation of dispensaries, maternities, and centers of child welfare, and (2) in campaigns against social diseases in the wider sense, both endemic and epidemic, by the organization of sanitary methods.

THE SELECTION AND MEDICAL SUPERVISION OF AVIATORS

Dr. Brabant discussed the selection and medical supervision of aviators. He stated that 90 per cent of the accidents that occurred at the beginning of the war before any systematic selection of aviators was made were due to the pilot, 8 per cent to faults in the mechanism, and only 2 per cent to projectiles of the enemy.

The author gave what he considered the indispensable qualifications for a physician who serves as examiner and adviser in an aeronautic service: he should have a fundamental knowledge of aviation; he should have made or should make some flights himself; he should know the aviators personally and enter into their lives; in short, he should serve them in one sense as "manager."

THE WORK OF THE INTERNATIONAL CONFERENCE ON THE HEALTH OF THE SEAMAN, HELD AT OSLO

M. Humbert, director of the health section of the League of the Red Cross Societies (Paris), discussed the work of the official international organizations that look after the welfare of seamen: (1) the international bureau of public health; (2) the international bureau of labor; (3) the maritime parity commission; (4) conferences of seafaring men on medical examinations, social insurance and medical certificates of embarkation; (5) legislation in various countries providing for the establishment of antivenereal dispensaries for seamen, financial compensation in case of accident or sickness, and medical treatment at the expense of the shipowner or the state; (6) the League of the Red Cross Societies in international conference, which (*a*) in maritime ports, in plain view of the wharves, maintains bureaus that are able to give treatment or to direct the patient to the proper medical center, facilitate the transmission of letters, give information in regard to local welfare organizations and suitable lodgings; and (*b*) creates a permanent committee of the International Bureau of Labor, of the Organization d'hygiène de la S. D. N., and of the Red Cross societies of various countries.

Subjects for special study by the committee are: (1) standardization of medicine chests; (2) the editing and publishing of a manual of health; (3) revision of the radiotelegraphic code; (4) instruction of marine officers in first aid, and (5) improvement of a seaman's life on board ship and in the ports. There is a need of improving the facilities for wireless consultation of vessels which carry no physician. There are beginnings of such organization in some countries, such as the United States and the Scandinavian countries, but the subject is one of international scope. The Red Cross is studying into the best means of solving the problem. Dr. R. Bernard's recent account of his experiences at sea, along this line, has attracted considerable attention.

TRACHOMA

M. de Peyrelongue, professor of clinical ophthalmology at the French Faculté de Médecine in Beirut, discussed the question of trachoma in Syria and more particularly in Great Lebanon. He outlined a campaign based on intensified prophylaxis. As notification is not compulsory here, attention should be focused on medical examination of immigrants, more careful supervision of schools, more complete instruction of physicians in charge of trachoma patients and of those who are directors of dispensaries in the interior, suitable training for teachers and pupils, spreading of information among families, an understanding between the practitioners of a community with reference to the best conduct of the local campaign, and a special appropriation to meet the expenses of proposed measures. Whatever means are adopted, in order to be effective an account must be taken of the customs and habits of the people.

VENTILATION OF SCHOOLS

Dumont Sillevaerts and Van Boeckel have determined that the quantity of carbon dioxide in schoolrooms is largely in excess of normal in spite of the fact that ventilation apparatus is operated for more than twelve hours. Under these conditions, windows must be opened if this elementary hygienic need is to be met.

COLLABORATION BETWEEN CIVIL AND MILITARY AUTHORITIES IN MATTERS OF HYGIENE

Dr. Graveline emphasized that the army eliminates from its ranks the weak, the incapable and the sick. Therefore, the collaboration of the civil and military services should be as close as possible and should constitute a mutual system of continued social prophylaxis. Civil society should coordinate its efforts in behalf of its members and should endeavor to break down the unnatural barriers that separate its hygienic services.

OPPOSITION TO THE GROWING APARTMENT HOUSE SYSTEM

M. Attout called attention to the fact that large apartment houses are becoming more and more frequent in Belgium. He wishes that the old family house, of two stories at the most, with its own individual garden, might be restored to favor. The solution, as he sees it, consists in improving the transportation service so that the growing population may seek homes in the outlying districts; in other words, that the cottage system may be realized in the city.

MEDICAL INSPECTION OF SCHOOLS

Dr. Charbonnier expressed his view that the medical inspection of schools should be entrusted to a physician who has given up his regular practice but who has long medical experience back of him. The quality of school medical inspection depends chiefly on the character of the physician and, secondarily, on the kind of aid he receives from the school nurse. In addition, information furnished by the teachers makes it possible to prepare a card index system that will be of value in applying the principles of vocational guidance. School medical inspection should be introduced in private schools, the grammar schools and the high schools. The record card or book should follow the child all through school and should constitute his sanity record. The chief physician of a communal public health service should have control of the school medical inspection service.

MEDICAL CONSULTATIONS ON THE HIGH SEAS BY WIRELESS

Bernard and Haeck believe that wireless medical consultations are destined to become a regular maritime practice. There are no insurmountable difficulties in the way, but certain international agreements and understandings will be needed. A special international radiotelegraphic code will be necessary. The transmission of medical consultations, while enjoying a certain priority and being, for the most part, of a gratuitous nature, must not interfere with international communications nor be incommoded by such. It will therefore be necessary to assign to such consultations a special wavelength to be determined by international agreement. The best way to introduce the idea promptly would be to present the matter before the International Conference of Radiotelegraphy, to be held in Washington in November, 1927.

BERLIN

(From Our Regular Correspondent)

Aug. 27, 1927.

The Marriage Prospects of the Woman Industrially Employed

There has not been much reliable information concerning what percentage of women industrially employed marry, although, from a social and psychic standpoint, it is important to determine how marriage is affected by the increasing participation of women in industrial pursuits. The recently published official data of the Bavarian statistical bureau on the percentage of marriages during the year 1924 among women employed in the various industries bring welcome figures.

It was established that 81.5 per cent of the women marrying in 1924 had been engaged in some earning capacity, a figure that permits the conclusion that industrial employment is no hindrance to marriage but rather furthers it. The fact that, according to the general industrial census, only 40.8 per cent of women industrially employed are married, is to be explained by the circumstance that, in the general industrial census, the girls who are not of marriageable age constitute a large proportion of the total, although in statistics on marriage they are not to be considered. From these general statistics, however, it has proved possible to figure out the percentage of marriages among the various industries. Of the women engaged in agricultural pursuits, 1.8 per cent were married in 1924. Of those employed in the industries, in the narrower sense, 3.2 per cent married in that year, and of the women commercially employed 3.3 per cent entered upon the married relation. These figures are explainable by the exodus of women from the country to the cities, which takes place, for the most part, during the marriageable age. Of especial interest are the publications of Bavaria concerning the mutual callings of the married couples. It may be noted, in the field of agriculture, that 71 per cent of the independent landowners married daughters or relatives of other landowners, 90 per cent of whom had been previously employed on the estates of their parents. Forty-nine per cent of agricultural laborers married agricultural workers, 25 per cent of whom were relatives of landowners and 6 per cent were previous landowners. Twenty-five per cent of independent industrialists married daughters of farmers, who had previously worked on the farms of their parents. Twenty-one per cent married employees and workers; 7 per cent married women who had been independently employed in trade and industry; 20.5 per cent married members of families engaged in various callings, and 10 per cent married domestic workers. While only 5 per cent of independent agriculturists and 20.5 per cent of independent industrialists married women not gainfully employed, the corresponding proportion of independent merchants was 25 per cent. Forty-one per cent of mercantile employees married women who before marriage were employed in trade and industry; 10 per cent married employees; 7 per cent married women domestically employed on the farms of their parents; 23 per cent married members of families, and 23 per cent married members of families, who were not gainfully employed. Among the workers we note that two thirds of all textile workers married industrial employees, whereas miners, foundrymen and peat-cutters, workers in the stone and earth industries, and workers in the building trades, preferred, to a great extent, women from the agricultural districts. A large percentage of the workmen in the chemical industries married domestic workers. It may be assumed that the percentage of female domestic workers marrying is much greater than in other occupations. If that fact is not clearly established by the general industrial statistics it is because the domestic workers are counted in with the women employed in the homes temporarily.

The figures that supply information as to what extent men engaged in the higher callings marry women gainfully employed are especially significant. It is evident that men of that class; for example, the higher officials, army officers and professors, are marrying more and more frequently women who have been industrially employed. Fifty-two per cent of the physicians are marrying women of that class, while 60 per cent of the teachers and 75 per cent of the artists and authors do likewise. Of the higher officials and army officers, 41 per cent marry women who followed industrial pursuits before their marriage. Of the higher callings, the artists and authors marry, then, the highest percentage of women industrially employed and the higher officials and army officers marry the lowest percentage. The reason why members of these callings seek as wives, more and more frequently, women industrially employed is doubtless mainly due to the fact that, since the war, the number of women gainfully employed has greatly increased, many of the female representatives of the first families having taken employment. Another reason lies in the fact that the prejudices against women industrially employed that, before the war, still existed in some quarters have disappeared. The class of young women who used to sit idly at home and long for the appearance of their future husband is fast disappearing. The percentage of middle-class officials and noncommissioned officers who marry women previously gainfully employed is 75, and the percentage of petty officials and enlisted men who marry women industrially engaged is 83. In the latter groups, therefore, women previously employed make up almost the entirety of the successful candidates for marriage.

Infant Mortality in East Prussia from 1904 to 1926

During the past twenty-five years, there has been a considerable decrease in infant mortality. In 1901, 19.97 per cent of the children in Prussia died under 1 year of age. In 1904, Lower Silesia with a percentage of 24.6 and Hesse-Nassau with a percentage of 12.9 had the highest and the lowest mortality rate, respectively. In 1926, the only region with a higher infant mortality than the lowest for 1904 was Upper Silesia, where a rate of 14 per cent still prevailed. In 1926, Hesse-Nassau again had the lowest mortality (6.9 per cent, or only a trifle over half that of 1904).

In East Prussia, the infant mortality rate in 1904 for children under 1 year of age was 17.6. In 1910 the rate had increased to 18.9. By 1913, it had dropped to 18.5, marking only a slight improvement. Not until after the war was any marked decrease noticeable, but in 1924 the rate had decreased to 12.5. The year 1925 brought a further decrease to 11.6. In 1926, the rate rose again to 12 per cent, which was one of the highest rates for any province of Prussia. Only Lower and Upper Silesia had higher rates. But East Prussia is still far from attaining the low rate of Hesse-Nassau.

Marriages

HENRICUS JOHANNES STANDER, Baltimore, to Miss Florence Mary Leigh Creelman of Vancouver, B. C., Canada, at Montreal, September 12.

LOUIS GORDON FRITH, Chillicothe, Mo., to Miss Gladys Mildred Dykes of Colfax, Ind., at St. Louis, recently.

EUGENE C. PIETTE, Oak Park, Ill., to Miss Ruth Elizabeth Bowers of Chicago, September 17.

GEORGE CRAIG LUDLOW to Miss Mary Gallatin Hoppin, both of New York, September 15.

HUBBARD LYNCH to Miss May Stoddard Yoemans, both of New York, September 10.

NINA S. LITVIN, Chicago, to Mr. Gladie T. Svenchansky of New York, September 15.

JOHN H. BLISS, Rochester, Minn., to Miss Alice Rye, at Starbuck, September 3.

ISADORE PAT BRONSTEIN to Miss Sylvia C. Lome, both of Chicago, in August.

Deaths

Charles Baldwin Lyman ⊕ Denver; Harvard University Medical School, Boston, 1886; professor of clinical surgery, University of Colorado School of Medicine, Denver; member of the Western Surgical Association; on the staffs of the University, St. Joseph's, Denver General and the Children's hospitals; aged 63; died suddenly, August 24, of myocarditis.

Alexander M. Linn, Des Moines; Hahnemann Medical College and Hospital, Chicago, 1883; member of the Iowa State Medical Society; formerly member of the Iowa State Board of Medical Examiners and member and past president of the state board of health; aged 73; died, August 22, of carcinoma of the pancreas.

George Stetson Eddy, Winchester, Mass.; Harvard University Medical School, Boston, 1866; member of the Massachusetts Medical Society; Civil War veteran; formerly on the staffs of the Union and St. Ann's hospitals, Fall River; aged 84; died, August 22, at Little Compton, of valvular heart disease.

Adin Louis Smith ⊕ Machias, Maine; Jefferson Medical College of Philadelphia, 1896; secretary and past president of the Washington County Medical Society; aged 58; died, July 17, at the Peter Bent Brigham Hospital, Boston, of meningitis, following an operation for mastoiditis.

Fred Fenton Jones, Pawhuska, Okla.; Medical Department of Columbian University, Washington, D. C., 1893; member of the Oklahoma State Medical Association; served during the World War; aged 59; died, August 22, at the Pawhuska Municipal Hospital, of cerebral hemorrhage.

Harry Charles Martin ⊕ Springfield, Mass.; Dartmouth Medical School, Hanover, N. H., 1898; served during the World War; formerly on the staff of the Mercy Hospital; aged 49; died suddenly, September 12, at his home in Long Meadow, of heart disease.

Clement Francis Dougherty, Eagle Rock, Calif.; College of Physicians and Surgeons, Keokuk, Iowa, 1890; formerly a practitioner in Wisconsin; served during the World War; aged 63; died, March 2, of acute myocarditis following infected teeth.

John Marshall Williams, Norman, Okla.; Louisville (Ky.) Medical College, 1889; member of the Oklahoma State Medical Association; health officer of Norman and formerly health officer of Wagoner; aged 65; died, June 12, of cerebral hemorrhage.

Richard S. Schroeckstein, Marion, Wis.; Keokuk (Iowa) Medical College, 1891; member of the State Medical Society of Wisconsin; formerly bank president; aged 64; died, August 15, at a sanatorium in Wauwautosa, of cerebral hemorrhage.

John Deering McGuire, West Warwick, R. I.; Georgetown University School of Medicine, Washington, D. C., 1914; formerly health officer of West Warwick; aged 37; died, July 8, at the Bridgeport (Conn.) Hospital, of heart disease.

Thomas Henry Davis, Cleveland, Tenn.; Chattanooga Medical College, 1900; member of the Tennessee State Medical Association; formerly on the staff of the Speck Hospital; aged 50; died suddenly, August 14, of heart disease.

Felix John Langenhorst ⊕ Chicago; State University of Iowa College of Medicine, Iowa City, 1895; University of Pennsylvania School of Medicine, Philadelphia, 1897; aged 59; died, August 20, of carcinoma of the pancreas.

Evan William Evans, Easton, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1884; member of the Medical Society of the State of Pennsylvania; aged 65; was found dead, in August, of heart disease.

Robert Hineman H. Smith ⊕ Eureka, Ill.; Kansas Medical College, Topeka, 1905; past president of the Mercer County (Ill.) Medical Society; on the staff of the Eureka Hospital; aged 47; died, August 18, of heart disease.

Percy Walter Swett ⊕ Cedar Rapids, Iowa; Harvard University Medical School, Boston, 1894; on the staff of St. Luke's Methodist Hospital; aged 57; died, July 17, of an infection following a dental operation.

Alfred Irby, Cisco, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1885; member of the State Medical Association of Texas; aged 70; died, recently, of carcinoma of the sigmoid.

John Everett Groves ⊕ Uhrichsville, Ohio; Columbus Medical College, 1880; for many years member of the board of education; aged 70; died, July 21, of cerebral hemorrhage and diabetes mellitus.

James V. Otto, Port Allegheny, Pa.; University of Buffalo (N. Y.) School of Medicine, 1878; member of the Medical Society of the State of Pennsylvania; aged 70; died, July 16, of acute nephritis.

John Sutton Outlaw, Los Angeles; Howard University School of Medicine, Washington, D. C., 1891; member of the California Medical Association; aged 63; died, July 26, of pneumonia.

Edward Edson Krider, Oelwein, Iowa; State University of Iowa College of Medicine, Iowa City, 1905; member of the Iowa State Medical Society; aged 44; died, July 3, of cerebral hemorrhage.

Herbert Edwin Buffum, Somerville, Mass.; Harvard University Medical School, Boston, 1897; member of the Massachusetts Medical Society; aged 55; died, August 25, of heart disease.

Oliver F. Partridge, Laurel, Miss.; University of Louisville (Ky.) School of Medicine, 1893; aged 58; died, August 13, as the result of a cerebral hemorrhage, suffered some time ago.

Charles S. Gilchrist, Iloilo, P. I.; Louisville (Ky.) Medical College, 1895; member of the Philippine Islands Medical Association; aged 55; died, in August, of cerebral hemorrhage.

Samuel Koser Shenck, Riley, Kan.; Kansas City (Mo.) Medical College, 1896; Rush Medical College, Chicago, 1897; aged 56; died, June 18, at Plainville, of heart disease.

Charles F. Wright, Syracuse, N. Y.; Long Island College Hospital, Brooklyn, 1877; on the staff of the Crouse-Irving Hospital; aged 75; died, June 3, of heart disease.

James D. Evans, Fort Gibson, Okla.; Meharry Medical College, Nashville, 1903; aged 55; died, recently, at Nashville, Tenn., of cerebral hemorrhage.

James Marion Ausmus ⊕ Fonde, Ky.; Tennessee Medical College, Knoxville, 1901; aged 53; died, August 20, of injuries received in an automobile accident.

Thomas Benjamin Johnson, Jr. ⊕ Towanda, Pa.; Medico-Chirurgical College of Philadelphia, 1903; aged 48; died, August 4, of cirrhosis of the liver.

Charles James Jenkins, Edison, Ga.; Atlanta Medical College, 1895; member of the Medical Association of Georgia; aged 59; died, July 24, of paralysis.

Edward C. Hydrick, Watson, Ark. (licensed, Arkansas, 1903); aged 63; died, June 7, at a hospital in Little Rock, of chronic interstitial nephritis.

Thomas M. Wallace, Canfield, Ark.; Memphis (Tenn.) Hospital Medical College, 1894; aged 61; died recently, of pulmonary tuberculosis.

Thomas W. Prose, Woodland, Calif.; Columbus (Ohio) Medical College, 1884; aged 70; died, June 14, at Colfax, of pulmonary tuberculosis.

John Reed Hunter, Hoosier, Sask., Canada; American Eclectic Medical College, Cincinnati, 1895; aged 57; died, July 1.

J. N. Picotte, Montreal, Que., Canada; University of Montreal Faculty of Medicine, 1888; aged 67; died, August 3.

The Propaganda for Reform

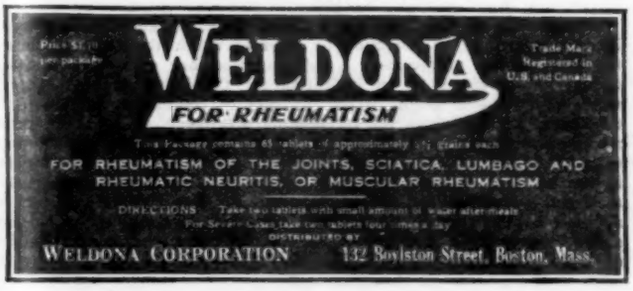
IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

WELDONA

A Piece of "Rheumatism Cure" Quackery

"Weldona" is sold by the Weldona Corporation (previously Weldona Company) of Boston as a remedy for "rheumatism." Until comparatively recently, the stuff seems to have been advertised and sold mainly in the East; now there seems to be a move toward advertising it in the Middle West. In 1922, THE JOURNAL received a telegram from the health commissioner of a Massachusetts city stating that an adult, with marked jaundice, was dying after continued use of Weldona tablets. At that time our information regarding the composition of this product was incomplete, but analysis had shown the presence of much sodium salicylate.

In 1924, THE JOURNAL published the results of an analysis, which was to the effect that the "Weldona Treatment" consisted of small, white tablets and large lavender-coated tablets. The white tablets, which were labeled "For Constipation Only," were found to contain an emodin-bearing extract, probably cascara. The medicinal portion of the lavender-colored tablets was found to contain sodium salicylate and


WELDONA
FOR RHEUMATISM
FOR RHEUMATISM OF THE JOINTS, SCIATICA, LUMBAGO AND RHEUMATIC NEURITIS, OR MUSCULAR RHEUMATISM
DIRECTIONS
WELDONA CORPORATION 132 Boylston Street, Boston, Mass.

an unidentified vegetable extractive. No alkaloids, iodides, acetylsalicylic acid, phenyl salicylate or neocinchophen were found.

In the issue of June 4, 1925, the *Boston Medical and Surgical Journal* gave some case reports by Dr. Richard C. Cabot from the Massachusetts General Hospital. In discussing one of the cases, Dr. Cabot said:

> "We have had rather an extraordinary series of cases of acute yellow atrophy in patients who have been taking this medicine called 'Weldona,' so that this disease is naturally suggested to anybody who has been attending these exercises when we hear that word."

The Health Bureau of Rochester, New York, made some tests of Weldona in 1925, and reported that alkaloids were found, but were not identified, together with salicylates or salicylic acid.

In 1926, the A. M. A. Chemical Laboratory completed another analysis of Weldona. The treatment set consisted of two parts: sixty-five lavender colored tablets and five white tablets. The envelop containing the white tablets was labeled "For Constipation Only." The medicinal portion of the lavender tablets, weighing about 4½ grains, consisted essentially of salicylic acid and acetylsalicylic acid, extractives of an emodin-bearing drug with other vegetable extractives, ground ginger and cinnamon. The medicinal part of the white tablets weighed approximately 3½ grains each and qualitative tests indicated that it consisted of extract of cascara.

Now, in 1927, advertisements for Weldona are being offered newspapers in the Middle West. To one such paper, the advertising agency handling the advertising gave what purported to be a list of ingredients of Weldona, although no quantities were given. The list was: Neocinchophen, Extract of Cimicifuga, Fluid Extract of Phytolacca, Magnesium Carbonate Light and Powdered Extract of Cascara Sagrada.

A commercial laboratory that analyzed Weldona in September, 1927, reported that it consisted largely of vegetable matter, with about 5½ per cent of mineral matter. The vegetable matter was, apparently, phytolacca and cascara sagrada, together with acetylsalicylic acid (aspirin) and salicylic acid. The laboratory did not satisfactorily prove the presence or absence of neocinchophen, but did report that tests for alkaloids showed none present.

It seems evident from these various analyses, made over a period of years, that Weldona, like so many other "patent medicines," is a name rather than a thing—while the name has remained constant the composition has varied.

ARC EPILEPSY REMEDY

Another Phenobarbital (Luminal) Mixture

The medical profession has recently been widely circularized by the American Remedies Company of Rockford, Ill. The circular letter, which is signed C. E. Fort, Manager, opens with these two contradictory paragraphs:

> "In an ethical way, we are offering to the Medical Fraternity, a Reliable Remedy for Epilepsy."
>
> "We are human however, and for the time being we do not feel justified in exposing our formulae to the public."

These statements in themselves are sufficient to make clear the professional status of the American Remedies Company. The circular letter goes on to state that the ARC Epilepsy Remedy "was perfected by one of the best known and successful practitioners of the Middle West, and tested by him in private practice for 18 years before being offered to the profession." It would be interesting to know who this well known and successful practitioner is whose prescription is now being offered to the medical profession as a nostrum of secret composition. According to the same letter, this well known and successful practitioner holds that "epilepsy originates in the digestive tract."

The American Remedies Company offers the old, old bait of a free sample. Those who write for it are sent a small bottle containing thirty capsules, filled with a grayish powder. It is evidently the intention of the concern that the bottle shall be turned over to the patient, as the label is attached only by one corner. This, of course, is an old dodge on the part of nostrum exploiters who wish to use the medical profession as their unpaid agents for introducing their preparations.

The directions on the label state that one capsule is to be taken daily at bedtime and that the patient is to "abstain from all meats, raw apples, nuts and popcorn." A letter comes with the free sample, in which Mr. Fort (the manager) gives some further suggestions to the medical profession regarding the administration of this preparation. In severe cases, the physician is told, two capsules a day should be given for the first four days, while in the case of children from 6 to 10 years of age, one-half capsule daily is the dose.

A few unopened, original packages of "ARC Epilepsy Remedy" were turned over to the A. M. A. Chemical Laboratory, with the request that they determine the presence or absence of either bromides or phenobarbital (luminal), the two substances that form the essential drug in practically all epilepsy cure nostrums. The laboratory reported that each package of "ARC Epilepsy Remedy" contained thirty capsules the contents of which averaged about 2⅓ grains. Each capsule was found to contain about 1½ grains of phenobarbital (luminal) and a considerable amount of a laxative (emodin-bearing) drug and a small amount of dye.

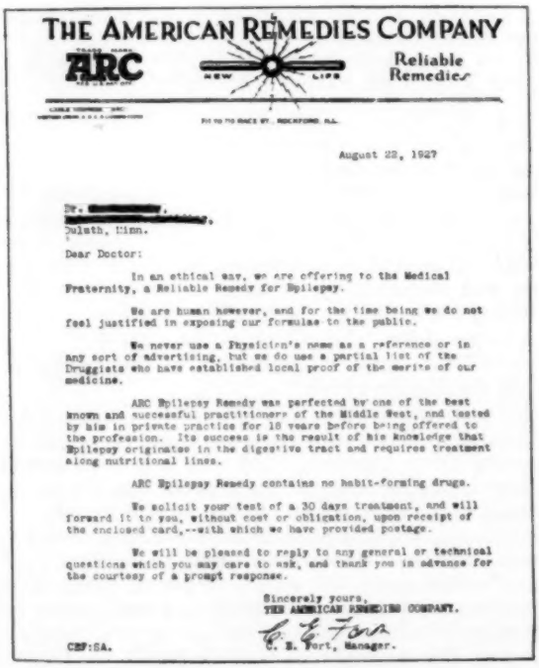
Evidently, then, this "prescription" of a well-known and successful practitioner, tested for eighteen years before being offered to the public as a nostrum, is essentially phenobarbital. Is it possible that there are physicians who are so gullible and forgetful of their duty to their patients that they will give a dangerous drug in unknown dosage simply because some man with no medical training sees fit to circularize them and offer free samples? Mr. Fort, the manager and owner of the American Remedies Company, is also manager

of a concern that markets floor covering; previous to that he was with a coal concern. A fine training for a pharmaceutical business!

Some physicians who received the American Remedies Company's first letter wrote to the concern stating that they would not administer a drug of whose composition they were ignorant, and asked the American Remedies Company for information on this point. The nostrum concern has an answer all ready for such inquiries. It is, first, a definite refusal to give any information regarding the ingredients of ARC Epilepsy Remedy; second, it claims that the nostrum is "being administered to sizable groups of epileptics in a number of public institutions," and goes further in declaring that it is being administered to epileptics by:

"THE STATE OF ILLINOIS"
"THE NATIONAL ASSOCIATION FOR THE STUDY OF EPILEPSY, UTICA, N. Y."
"THE UNITED STATES GOVERNMENT."

If these claims are true, it indicates that the individuals who are responsible for administering to state and national charges a remedy of which they know nothing are unfit for the positions they hold.



THE AMERICAN REMEDIES COMPANY

ARC — NEW LIFE — Reliable Remedies

August 22, 1927

Dr. [redacted]
Duluth, Minn.

Dear Doctor:

In an ethical way, we are offering to the Medical Fraternity, a Reliable Remedy for Epilepsy.

We are human however, and for the time being we do not feel justified in exposing our formulae to the public.

We never use a Physician's name as a reference or in any sort of advertising, but we do use a partial list of the Druggists who have established local proof of the merits of our medicine.

ARC Epilepsy Remedy was perfected by one of the best known and successful practitioners of the Middle West, and tested by him in private practice for 18 years before being offered to the profession. Its success is the result of his knowledge that Epilepsy originates in the digestive tract and requires treatment along nutritional lines.

ARC Epilepsy Remedy contains no habit-forming drugs.

We solicit your test of a 30 days treatment, and will forward it to you, without cost or obligation, upon receipt of the enclosed card,--with which we have provided postage.

We will be pleased to reply to any general or technical questions which you may care to ask, and thank you in advance for the courtesy of a prompt response.

Sincerely yours,
THE AMERICAN REMEDIES COMPANY.
C. E. Fox
C. E. Fox, Manager.

CEF:SA.

The third claim is "the unqualified statement that there are no harmful ingredients in ARC Epilepsy Remedy." This, as analysis has shown, is utterly false. Phenobarbital is a potent remedy and accumulating evidence makes it clear that it should never be used without accurate knowledge of the amount given and the result to be expected.

A physician who uses or prescribes "ARC Epilepsy Remedy," giving so dangerous a drug as phenobarbital in unknown dosage, may lay himself open to a charge of doubtful practice.

New Type General Practitioner.—A new type of general practitioner is developing. Just what he will be when fully developed, one cannot now say. But we may properly consider. We may safely predict that he will be human with strength and frailty of character mixed in different proportions much as now. He will not differ much from the average of the race about him. He will work, as now, for gain, reputation, opportunity, power. We trust he will not be too commercial. There is quite prevalent today an unfortunate trend of thought which too emphatically views medicine as a trade. The laborer is worthy of his hire. But is it not possible to retain some of the old tradition of medicine as a profession and not a trade?—Herrick, J. B.: *California & West. Med.* **27**:182 (Aug.) 1927.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

PRIAPISM

To the Editor:—A patient with chronic myeloid leukemia has had priapism for five days. Is there anything that will relieve this condition? I have tried heat, cold, anesthetics and sedatives. The patient has had roentgen-ray applications to the spleen and long bones; also benzene and arsenic. His only complaint is priapism. There is no history of injury. Please omit name.

M.D., Oklahoma.

ANSWER.—Chronic painless priapism is always based on some general disorder, usually of the nervous system. Relief of the condition depends on the amelioration of the underlying derangement. Local applications, drugs and venesection as a rule fail in their purpose.

DISPOSAL OF SEWAGE IN CAMPS

To the Editor:—Is a book published that will give me the following information? A friend of mine has a fishing camp in the Canadian woods. The problem I wish to solve is the best way to take care of the outdoor toilets, how to deodorize, disinfect and best way of disposing of the excreta.

J. H. KENEALY, M.D., Cleveland.

ANSWER.—See Hardenbergh, "Home Sewage Disposal," published by the J. B. Lippincott Company.

"INDUCTION OF LABOR"

To the Editor:—In Queries and Minor Notes, August 20, appears an inquiry regarding the induction of labor to which the reply is, to say the least, rather pernicious. 1. A ruptured bag of waters of itself cannot be considered as an indication for the induction of labor. It may, however, add weight in the presence of conditions that are to be considered as indications for terminating pregnancy. 2. The escape of amniotic (or and) fluid from the parturient tract is not prima facie evidence of the rupture of the bag of waters, and must be differentiated in the presence of such conditions as decidual hydrorrhea gravidarum, amniotic hydrorrhea and amnitis cystica. 3. The risk of infection, as a result of the rupture of the bag of waters, cannot as yet be considered equal to the risk of infection attending the mechanical induction of labor. Unindicated—unintelligent—intervention is still the greater error in the practice of obstetrics.

GILBERT FITZ-PATRICK, M.D., Chicago.

ANSWER.—1. De Lee (ed. 4, p. 679) says, "In the later months of pregnancy, owing to the patulousness of the cervix, rupture of the membranes is often succeeded by fever and therefore I usually do not wait for pains to supervene. If the child is surely viable and the uterus does not assume action within two or three days, I usually start it by inserting a colpeurynter."

2. The term hydrorrhea gravidarum means the passage of watery fluid from the pregnant corpus uteri. Two types are generally distinguished: (1) amniotic hydrorrhea, which is derived from the contents of the bag of waters, the liquor amnii, and (2) decidual hydrorrhea, which is considered to be an abnormal secretion of the glands of the decidua. From a practical point of view, all fluid which escapes from the uterus near term is considered to be liquor amnii. De Lee (p. 555) says: "In the differential diagnosis, rupture of the bag of waters, rupture of the chorion and the escape of subchorionic fluid and hydrorrhea are to be considered. The latter two cannot be distinguished from each other, but liquor amnii can often be recognized by flocculi of vernix caseosa, if late in pregnancy, by the lanugo hairs and sometimes by meconium. Usually it is impossible to make the diagnosis and in all cases the patient is treated as if she were threatened with abortion."

Many authors doubt the existence of the condition known as decidual hydrorrhea. In all the reported cases the true condition was most likely an amniotic hydrorrhea. Strongly in favor of this view is the fact that since Stoeckel, Holzapfel and Reifferscheid in 1899 to 1901 made known in Germany the existence of exochorial pregnancy, which consists in rupture of the membranes with continued development of the fetus in the uterus but outside the chorion, not a single case of decidual hydrorrhea has been reported in the German literature.

3. Williams (ed. 4, p. 714) says: "Premature rupture of the membranes not only leads to prolongation of labor but

also increases the probability of intrapartum infection. . . . Even when the mother escapes infection, the condition is not devoid of danger as it has long been known that in such cases the child, which is born alive, may succumb a few days later." De Lee's opinion concerning infection is stated in answer 1. Many German authors, notably Bumm, Stoeckel and Zangemeister, emphasize that a real danger of infection exists after premature rupture of the membranes.

In the answer of the query the advice given was "to induce labor medicinally or mechanically" after three days from the time of rupture of the membranes. The intention was that medicinal induction by means of castor oil and quinine, or this combined with the intranasal application of solution of pituitary, should be tried first, for no one will deny that these drugs are less dangerous mechanical measures and should therefore be used first. There is no doubt that the mechanical induction of labor is fraught with some danger and it is therefore not an operation to be performed in a home. It is a hospital procedure, and a physician who attempts induction should always observe the rules of asepsis, and also know how to employ properly the mechanical aids of induction. Mechanical induction of labor, properly and aseptically performed in a clean hospital, carries very little risk.

ACIDOSIS WITH ACETONE IN URINE

To the Editor:—Do you regard it as being probable or possible for an individual to have so-called acidosis; in other words, the formation or retention in the blood and tissues of an excess of nonvolatile acid substances, with diminution of the normal blood carbonate, without the appearance of acetone bodies in the urine?

C. E. SWIFT, M.D., Elkins, Ark.

ANSWER.—The presence of an excess of nonvolatile acid substances in the blood with diminution of the blood carbonate without the appearance of acetone and diacetic acid has been recognized since 1883. Twelve or more reports of such nature are to be found in the literature, nearly every case being associated with diabetic acidosis or coma. Feinblatt reported a case of diabetic coma in a 9 year old patient, with a strong acetone odor to the breath, 3 per cent sugar in the urine, with only a faint trace of acetone but no diacetic acid, the carbon dioxide combining power of the blood measuring 14.3 per cent by the Van Slyke method, with much acetone in the spinal fluid. Argy reported a case of coma with large amounts of acetone in the blood and spinal fluid, but no evidence of acetone or diacetic acid in the urine after repeated examinations.

BANANAS, GELATIN OR EGGS FOR INFANTS

To the Editor:—Two cases have come to me recently from a city in Louisiana, where the infants had been taken on account of a severe diarrhea. While there, their treatment, according to the mothers, consisted almost entirely of bananas and gelatin. These were given to the babies as soon as they arrived and while they were having twelve loose stools a day. While with Marriott I was told not to give a baby eggs in the first year; while in Chicago attending clinics I found Hess giving egg yolk as a routine, so maybe bananas are being given. I am trying to find out and I wouldn't be surprised at anything.

M.D., Arkansas.

ANSWER.—The use of bananas and gelatin in the treatment of acute diarrheas in infancy is indeed novel. In theory, the rational treatment of these diarrheas should start with an attempt to determine the etiology. Among the diarrheas of known enteral origin, those caused by the dysentery bacilli, typhoid bacilli and *Endameba histolytica* should require a different type of therapy than those diarrheas caused by a parenteral infection, such as otitis media, pyelitis or pneumonia. The great group of acute and chronic diarrheas of enteral origin and unknown etiology probably have no primary bacterial infection as a causative agent, but may be the results of changes produced by external heat or an improper or unbalanced diet, which alter the gastric acidity and motility, reduce the gastric and duodenal enzymes, thereby causing undigested and unabsorbed food to be fermented by the bacterial flora into irritating end-products which accelerate peristalsis and thus produce diarrhea. The action of these end-products is probably a chemical rather than a bacterial one. This explains the absence of postmortem lesions in the intestinal tract and explains the enigma which has baffled pathologists from Rokitansky's time to the present.

The basis of treatment for infantile diarrheas, regardless of etiology, is, first, to supply sufficient fluid intake for the fluid loss in the stool, and, second, when breast milk is unobtainable, the use of foodstuffs that will hinder fermentation. A food high in protein, low in fat and carbohydrate, such as buttermilk or protein milk, or foods of a high acidity, such as whole lactic acid milk, have proved the most efficacious because they hinder fermentation.

Bananas have a composition of 1.5 per cent protein, 0.6 per cent fat and 22 per cent carbohydrate. Thus, while they are low in fat, the protein is not high enough and the carbohydrate is too high to make them an ideal agent for combating fermentation. Gelatin is high in protein, and low in fat and carbohydrate, and was suggested by Jacobi in 1879 as a valuable additional food for use in malnutrition. Both bananas and gelatin have in late years been added to the diets of infants suffering with a chronic form of indigestion known as celiac disease. They have of course been used as additions to the diet. Protein milk is still recognized as the dietary backbone in this condition.

Egg yolk in the diet of infants under 1 year is used for its high antirachitic potency. It has apparently no proved advantage over cod liver oil or sunlight, and has the disadvantage of producing sudden and unpleasant allergic reactions in those infants who are sensitive to egg protein. One such allergic reaction would no doubt convince the average practitioner that eggs should first be added to the diet after the infant is 1 year of age and then in minute quantities to begin with.

The use of novel and bizarre articles of food in the diet of normal babies and those suffering with diarrheas has run through the list of the known edible foodstuffs. In the future we may have hope for some synthesized fool-proof product, superior even to nature's own best food for the infant—breast milk.

GASOLINE (PETROLEUM BENZINE) AND KEROSENE (COAL OIL) POISONING IN CHILDREN

To the Editor:—Please give me the probable and possible cause of death by kerosene. A child, aged 20 months, drank kerosene, August 14, at 8 p. m. By 10 o'clock the temperature was 102.2. It dropped to 101 in four hours. It remained at 101 until August 16. At 9 a. m. it was 100. The heart beat was between 150 and 160 all the time. Breathing was very fast and labored. The patient died, August 16, at noon. In five minutes after drinking kerosene, the stomach was emptied of all contents. Please omit name.

M.D., South Carolina.

To the Editor:—I have in mind a child, in fact two children, one aged 6 and one aged 10, who were siphoning gasoline from a tank and swallowed some, I do not know how much. Both of these children had very depressing symptoms, and one of them after three weeks has such depressing symptoms, shortness of breath and fast heart, that the physician in charge is afraid the child will die. The other one had severe pains in the chest but no symptoms of pneumonia. The child who is still very ill has acute dilatation of the heart. Are these symptoms usual in such cases, and do you know of any special treatment in these cases?

W. P. WILLIAMS, M.D., Blackshear, Ga.

ANSWER.—There is no definite line of demarcation between the constituents of kerosene and of gasoline. In general, gasoline consists of the lower boiling hydrocarbons and therefore is much less reactive. The inhalation of the vapors of gasoline (petroleum benzine) causes headache, nausea, giddiness, inebriation, unconsciousness, muscular tremors, convulsions, dyspnea, cyanosis and death. In animals treated with concentrated vapors, respiration is first stimulated, then weakened. There may be paralysis of the vagus, followed by a depression of the cardiac muscle and later of the vasomotor center. Drowsiness is reported as a prominent symptom in gasoline poisoning. In case of ingestion, unconsciousness has come on in from ten to fifteen minutes after the swallowing of less than half an ounce of benzine. According to Reid Hunt and Alexander O. Gettler (Chapter on "Non-Alkaloidal Poisons," Legal Medicine and Toxicology, Edited by Peterson, Haines and Webster, ed. 2, Philadelphia, W. B. Saunders Company **2**:603, 1923), the symptoms from the ingestion of benzine, consisting of dyspnea, cyanosis, unconsciousness, coldness of the skin, and dilatation of the pupils, are especially severe in children; of nine fatal cases compiled by Jaffe about ten years ago in Germany, eight occurred in children. From 10 to 15 Gm. (⅓ to ½ ounce) has proved fatal, death usually occurring in from ten minutes to four hours. A woman, aged 20, died in five hours from 30 Gm. (1 ounce); another recovered from 250 cc. The postmortem observations have sometimes been practically negative; in other cases there have been hyperemia and small hemorrhages in the gastro-intestinal tract and slight changes in the kidneys; also hemorrhages into the lungs and some hemolysis have been described. In cases of collapse, warm baths with cold affusions have been recommended, and the usual respiratory and cardiac stimulants are also indicated.

According to Sollmann (Manual of Pharmacology, ed. 3, 1926, p. 133), when petroleum (coal oil, kerosene) is swal-

lowed, it produces narcotic effects similar to those of alcohol, with strong gastro-enteritis. It is toxic in proportion to its content of the more volatile products. (Kerosene is not so toxic as benzine [gasoline], which is more volatile.) Relatively few fatalities have been reported from the swallowing of kerosene, though poisoning by this method in cases of children is not rare. The most marked symptoms result from the local action on the gastro-intestinal tract and consist in a burning pain in the throat and stomach, vomiting, colicky pains, diarrhea, great thirst and painful micturition. Drowsiness, cyanosis, labored respiration and unconsciousness may follow. There is no known antidote against kerosene poisoning. The promptest possible evacuation and energetic symptomatic treatment are therefore all the more required in the case of poisoning either by gasoline or by kerosene. A year ago Barbour (THE JOURNAL, Aug. 14, 1926, p. 488) stated that of four cases of kerosene poisoning coming to his attention in six years, one of the children died within a few minutes after medical aid was summoned, the others recovering. In one case, laboratory observations were possible. He reported that the clinical and blood picture was similar to that produced by illuminating gas, and suggested that "in severe cases of kerosene poisoning, blood letting and blood transfusion would seem to be indicated."

ASTHMOLYSIN

To the Editor:—Two or three times each year I receive letters from a Dr. Kade of Berlin apprising me of the high therapeutic worth of a product designated Asthmolysin. Inquiries have been addressed me regarding its efficacy in the treatment of asthma. I strongly suspect that it is no more efficacious than epinephrine hydrochloride but much more expensive. Will you please advise me whether it has such a distinctive therapeutic value as would render its use preferable to that of epinephrine hydrochloride (hypodermically) or ephedrine sulphate (orally)?

ANDREW C. MORAN, M.D., Somerville, Mass.

To the Editor:—A testimonial sheet for Asthmolysin is interesting in that it contains the names of many members of the A. M. A. Lucky Strike cigaret people were able to get about 10,000 testimonials—and all for about five cartons apiece of "Luckies." Sometimes, we doctors are cheaply bought. Please omit name.

M.D., Pennsylvania.

ANSWER.—Asthmolysin is, according to the advertising, "a combination of the suprarenal and pituitary hormones in distinct proportions," which is prepared by a "special method." There appears to be no scientific evidence to warrant the use of pituitary in bronchial asthma. Epinephrine is frequently used in some forms of asthma, but may be had pure and need not be prescribed in a secret preparation containing an undetermined amount.

Our correspondent in Pennsylvania is correct. The 1927 Asthmolysin circular consists of testimonials from 121 physicians, of whom thirty-five are Fellows and thirty-three are members of the American Medical Association, while fifty-three are neither members nor Fellows. Such testimonials, given for a semi-secret preparation of unscientific character, are no credit to those members of the supposedly learned profession that gave them.

VENEREAL WARTS

To the Editor:—Please let me know what is considered the quickest method of getting venereal warts removed. Please do not publish my name.

M.D., Michigan.

ANSWER.—The quickest method of removing venereal warts is cauterization of the small ones, and excision of the large ones followed by cauterization of the base. Following the procedure the parts should be kept as dry as possible and closely watched for the appearance of tiny warts overlooked at first. These should be treated at once.

SOLUTION FOR RINGWORM

To the Editor:—In your issue of August 6, Dr. James H. Mitchell speaks of Myers and Thienes' preparation of an alcoholic solution of cinnamon oil and thymol in the treatment of ringworm, but he does not give the exact formula. Will you please send me the formula? I have a bad case in which I should like to try it.

WILLIAM C. ALBERTSON, M.D., Belvidere, N. J.

ANSWER.—The formula found effective by Myers and Thienes consists of 2 per cent oil of cinnamon and 5 per cent thymol in alcohol. They advise painting this daily on the affected areas. In some cases the cinnamon oil is irritating, and the thymol alone may be used when irritation results.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: Memphis, Nov. 14. Sec., Dr. William H. Wilder, 122 S. Michigan Ave., Chicago.

ARKANSAS: Little Rock, Nov. 8-9. Sec., Reg. Bd., Dr. J. W. Walker, Fayetteville; Sec., Eclec. Bd., Dr. C. E. Laws, Ft. Smith.

CALIFORNIA: San Francisco, Oct. 17-20. Sec., Dr. Chas. B. Pinkham, 906 Forum Bldg., Sacramento.

COLORADO: Denver, Oct. 4. Sec., Dr. Philip Work, 324 Metropolitan Bldg., Denver.

CONNECTICUT: Hartford, Nov. 8-9. Sec. Reg. Bd., Dr. Robert L. Rowley, 79 Elm St., Hartford. Sec., Homeopathic Bd., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

CONNECTICUT: State Board of Healing Arts, New Haven, Oct. 8. Prerequisite to examination. Chairman, Dr. Charles M. Bakewell, Box 1895, Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, Oct. 11. Sec., Dr. Edgar P. Copeland, 1801 Eye St., Washington, D. C.

FLORIDA: Winter Haven, Nov. 14-15. Sec., Dr. W. M. Rowlett, 812 Citizens Bank Bldg., Tampa.

GEORGIA: Atlanta, Oct. 11. Sec., Dr. B. T. Wise, Plains.

IDAHO: Boise, Oct. 11. Commissioner of Law Enforcement, Hon. Fred E. Lukens, Boise.

ILLINOIS: Chicago, Oct. 4-6. Supt. of Regis., Mr. V. C. Michels, Springfield.

IOWA: Des Moines, Oct. 4-6. Dir. of Examinations and Licenses, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Topeka, Oct. 11. Sec., Dr. A. S. Ross, Sabetha.

MAINE: Portland, Nov. 8-9. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MASSACHUSETTS: Boston, Nov. 8-10. Sec., Dr. Frank M. Vaughan, 144 State House, Boston.

MICHIGAN: Lansing, Oct. 11-13. Sec., Dr. Guy L. Connor, 707 Stroh Bldg., Detroit.

MINNESOTA: Minneapolis, Oct. 18-19. Sec., Dr. A. E. Comstock, 636 Lowry Bldg., St. Paul.

MISSOURI: Kansas City, Oct. 25-27. Sec., Dr. James Stewart, Jefferson City.

MONTANA: Helena, Oct. 4-6. Sec., Dr. S. A. Cooney, Power Blk., Helena.

NEVADA: Carson City, Nov. 7. Sec., Dr. Edward E. Hamer, Carson City.

NEW JERSEY: Trenton, Oct. 18-19. Sec., Dr. Chas. B. Kelley, 1101 Trenton Trust Bldg., Trenton.

NEW MEXICO: Santa Fe, Oct. 10-11. Sec., Dr. W. T. Joyner, Roswell.

RHODE ISLAND: Providence, Oct. 6-7. Sec., Dr. Byron U. Richards, State House, Providence.

SOUTH CAROLINA: Columbia, Nov. 8. Sec., Dr. A. Earle Boozer, 505 Saluda Ave, Columbia.

TEXAS: Fort Worth, Nov. 15-17. Sec., Dr. T. J. Crowe, 918-19 Mercantile Bank Bldg., Dallas.

WEST VIRGINIA: Morgantown, Nov. 22. Sec., Dr. W. T. Henshaw, New Capitol Bldg., Charleston.

WYOMING: Cheyenne, Oct. 3-5. Sec., Dr. G. M. Anderson, Cheyenne.

Minnesota April Examination

Dr. A. E. Comstock, secretary of the Minnesota State Board of Medical Examiners, reports the oral, written, and practical examination held at Minneapolis on April 5-7, 1927. The examination covered 17 subjects and included 80 questions. An average of 75 per cent was required to pass. The candidates, numbering 31, all passed the examination. Ten candidates were licensed by reciprocity, and two by endorsement of their credentials. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
George Washington Univ. Med. School	(1923) 91.7,	(1925)	88.3
State University of Iowa Medical Department		(1926)	86.9
Harvard University Medical School		(1923)	86.6
University of Minnesota Medical School	(1926) 86.9, 87.5, 87.7, (1927) 85.6, 87.1, 88, 88.1, 89, 89.2, 89.9, 89.9, 90.4, 90.7, 90.7, 90.7, 91, 91.3, 91.6, 91.7, 93.8	(1907)	89,
St. Louis University School of Medicine		(1926)	85.9
University of Buffalo Department of Medicine		(1924)	88.3
University of Pennsylvania School of Medicine		(1920)	91.3
Medical College of South Carolina		(1925)	92.3
University of Toronto Faculty of Med.	(1921) 91.8, (1924)		93.4

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado School of Medicine		(1925)	Colorado
Emory University School of Medicine		(1922)	Georgia
Northwestern University Medical School		(1924)	Illinois
Rush Medical College		(1902)	Illinois
State University of Iowa Medical Department		(1925)	Iowa
Johns Hopkins University Medical Department		(1923)	Maryland
Washington University School of Medicine		(1924)	Missouri
Vanderbilt University School of Medicine		(1925)	Tennessee

University of Texas Department of Medicine	(1924)	Texas
University of Vermont College of Medicine	(1925)	Vermont

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement with
State University of Iowa Medical Department		(1924)	N. B. M. Ex.
Harvard University Medical School		(1924)	N. B. M. Ex.

North Dakota July Examination

Dr. G. M. Williamson, secretary of the North Dakota Board of Medical Examiners, reports the oral, written, and practical examination held at Grand Forks on July 5-8, 1927. The examination covered 13 subjects and included 100 questions. An average of 75 per cent was required to pass. Of the 10 candidates who took the examination, 9 passed, and 1 failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
State University of Iowa College of Medicine		(1926)	76
Northwestern University Medical School	(1926) 79;	(1927)	81
St. Louis University School of Medicine		(1926)	82.3
Washington University School of Medicine		(1926)	78
University of Manitoba Faculty of Medicine	(1925) 89.5, (1927) 79.9, 83.2	(1924)	82,

College	FAILED	Year Grad.	Per Cent
College of Medical Evangelists		(1924)	69.4

Book Notices

LISTER AS I KNEW HIM. By John Rudd Leeson, M.D., C.M., M.R.C.S., Senior Consulting Physician, St. John's Hospital, Twickenham. Cloth. Price, $3.50. Pp. 212, with illustrations. New York: William Wood & Company, 1927.

In the early seventies Dr. Leeson was for several years a dresser and clerk in Professor Lister's wards in Edinburgh, at the time when Lister's work was just being recognized in the world at large and when he was fighting against the apathy and opposition of his colleagues in the British Isles. Leeson, therefore, takes us back to the most interesting part of Lister's career. He is one of the few men living who, of his own knowledge, could do this. Lister is one of the Olympians of medicine; from his peculiar service he is one of the great figures of all times. We cannot now have too many intimate details of him, his surroundings and his work; as time goes on such knowledge will become even more valuable. It is highly desirable, therefore, that we should have this book from one who worked with him in his prime. It is particularly fortunate that such a man should be well able to discharge this task.

The book is realistic and vivid. It gives interesting glimpses of the Edinburgh Medical School in the seventies; of the conditions of hospital practice at that time, and particularly of the conditions under which Lister built up antiseptic surgery. All of us, of course, can imagine in a way what were the conditions of surgical practice before the days of bacteriology, but most of us hardly know the conditions under which Lister developed his successful technic on the basis of his knowledge of the origin of pus. It is well to have these conditions picture for us:

> After a kindly smile of greeting to his audience the Professor [Lister] seated himself on the old worn horsehair-covered chair which had served as the chair of clinical surgery for generations and must have been a museum of microbes, cast a towel over his knee, heaved the accustomed little sigh and began his lecture.
>
> In front of him stood the operating table, a plain kitchen table devoid of all accessories, upon an old wooden floor frayed with wear and stained with years of blood, upon which were sprinkled a few handfuls of sawdust; at the side of the window was a large leaden sink, but there were no basins or other provisions for the washing of hands, nor do I ever remember such washing taking place before commencing an operation; there was no removal of coats and only an occasional turning up of sleeves; everything was ordinarily dirty and from our modern standpoint unthinkable. Yet it was under such circumstances that antiseptic surgery won its triumphs. (P. 85.)

It was with carbolic acid that Lister won the original triumphs of antiseptic surgery and established the principles on which modern surgical technic has been developed. In all of this part of the book dealing with Lister's work, hospitals, and conditions of practice, the author concerns himself with intimate details. It is historically of great value and for us now is altogether worth while.

The book is equally successful in giving us a picture of Lister the man. There is a certain form of biography that affects to be superior to any consideration of the physical and ordinary human characteristics of its subject. It is the least interesting sort of biography. If a man is worth reading about it is natural to be interested in him as a human being. We like to have in mind a picture of the man. Blustering, lolling, gluttonous Dr. Johnson; round-headed, ingenuous, hesitating Oliver Goldsmith; or calm, dignified, austere-looking George Washington—these pictures are part of them. This human picture of Lister, Dr. Leeson furnishes extremely well. Evidently Lister was a great personality; not above medium height, he was handsome, with a fine head and dignified carriage; he dressed in the formal style of the Victorian gentleman, and was reserved, perhaps to the point of austerity—certainly to the point where nobody felt like taking familiarities with him. Dr. Leeson is not a hero worshiper and he calls attention more than once to the fact that Lister's assistants would have liked to get closer to him. But able as he was to see Lister in proper relations, Leeson was still enormously impressed by him. Lister, in fact, seems to have been a man a good deal after the style of General Robert E. Lee, and, like Lee, was the idol of those around him.

It is probably a false note to sound in considering so august a theme as Lister, but in picturing Lister's personality one is reminded of an anecdote of General Lee. In the early days of Darwinism, soon after the Civil War, some old Confederate soldiers were discussing the theory of evolution, even as it is being done so much now. One of them said to the other:

"Bill, what do you think of this idea that man is descended from monkeys?"

"Well Tom," Bill said, "maybe you and I and people like us are, but only God-Almighty could have made Marse Robert."

Lister, evidently, like Lee, was one of those rare very great men who looked the part.

Altogether, the book is worth while and interesting. It is an authentic historical record that will grow in value with the passing of time. Its writing was an obligation that rested on its author.

BEITRÄGE ZUR GESCHICHTE DER ERKENNUNG DER BERIBERI ALS AVITAMINOSE. Von Prof. Dr. G. Grijns. Neue Folge, Heft 1. zu Fortschritte der naturwissenschaftlichen Forschung. Herausgegeben von Prof. Dr. Emil Abderhalden. Paper. Price, 3 marks. Pp. 32. Berlin: Urban & Schwarzenberg, 1927.

The lapse of a quarter of a century often suffices to permit some of the significant facts of history either to be forgotten or to become somewhat distorted by later reviewers. In the case of contributions to science it may also happen that the facts are buried, so to speak, in comparatively inaccessible places such as the less familiar journals. Perhaps all these possibilities help to account for the apparent current neglect of the fundamental contributions of Grijns to what is today termed the vitamin hypothesis. It was the Dutch physician Eijkman who first described the production experimentally, in birds, of a form of polyneuritis that bears many resemblances to beriberi in man. He demonstrated that the polyneuritis gallinarum could be produced by feeding milled rice in contrast to the unmilled grain, and that rice polishings may avert the symptoms. He also found that the polyneuritis of experimental origin was not due to a shortage of protein as had been alleged. In the same laboratory, in Java, Grijns confirmed these observations. He demonstrated further that the avian polyneuritis resulting from the feeding of polished rice is not an expression of a lack of any of the familiar nutrients: the proteins, fat, carbohydrates or inorganic salts. Combating, by carefully planned experiments, the hypotheses of the existence of a beriberi toxin and of a bacteriologic etiology of the disorder current at that time, Grijns clearly postulated that it is due to a lack of some as yet unidentified food component. This was a decade before the word vitamin was coined. In his classic paper, of which the present monograph supplies a detailed abstract in translation from the

Dutch, Grijns wrote in 1901: In natural foods there occur various substances with which the peripheral nervous system cannot dispense without suffering harm. The cogent demonstration of this thesis is Grijns' outstanding contribution, now rendered easily accessible.

A TEXT-BOOK OF MEDICINE. By American Authors. Edited by Russell L. Cecil, A.B., M.D., Assistant Professor of Clinical Medicine in Cornell University, and Foster Kennedy, M.D., F.R.S.E., Professor of Neurology in Cornell University. Cloth. Price, $9 net. Pp. 1500, with 29 illustrations. Philadelphia: W. B. Saunders Company, 1927.

This tremendous volume covers the entire field of internal medicine. More than 120 authors have contributed to its pages. A study of the references to the article on influenza indicates no literature later than 1922, although undoubtedly the author, Dr. Blake, must have been familiar with more recent discoveries. He is somewhat doubtful as to the proof available for the direct causative relationship of *Bacillus pneumosintes* to this disease. In the article on lobar pneumonia, Dr. Cecil recommends particularly the use of oxygen and the usual symptomatic treatment. He is obviously inclined to favor the work done by Cole, himself and Blake with antipneumonia serums. He favors the use of Huntoon's antibodies, particularly in type I cases, at least by his method of presenting the evidence for this product. The article on scarlet fever was prepared by Helmholz, who recommends the use of Dick antitoxin in acute severe cases, whereas Tileston believes that the erysipelas antitoxin is still under trial. More recent evidence is inclined to support the claims made for the latter as well as for the former. A special discussion of focal infections is utterly inadequate. It would be possible to go through the entire volume and to call attention under each essay to its qualities or its failures. On the other hand, space does not permit, nor does the nature of such a volume warrant, a complete critical consideration. It is perhaps best to say that this collection of essays is quite up to any previous collection in its quality and makes a highly desirable reference work for any one who wants this kind of a book.

DIE CHIRURGIE. Eine zusammenfassende Darstellung der allgemeinen und der speziellen Chirurgie. Herausgegeben von Prof. Dr. M. Kirschner, und Prof. Dr. O. Nordmann. Lieferung 14. Band VI. Die Chirurgie der Harnblase. Die Chirurgie der Prostata und der Samenblasen. Von Prof. Dr. E. Wehner. Paper. Price, 18 marks. Pp. 751-1038, with 113 illustrations. Berlin: Urban & Schwarzenberg, 1927.

This is one of a series of monographs on the special fields of surgery. In the present instalment the surgery of the bladder, prostate and seminal vesicles is taken up in as simple a manner as possible for the purpose of keeping the general practitioner in touch with the progress of surgery. All the subjects are covered in a most thorough manner and each chapter is supplemented by a bibliography. There are abundant and excellent illustrations, many in colors. There are but few criticisms. The chief fault to find with the book is that it takes up the subjects in a far more exhaustive manner than would seem desirable for any one but a urologist. Aside from this, one need not hesitate to recommend the book for those who wish to keep abreast of the progress in urology.

EDITORIAL SILENCE. The Third Era in Journalism. By Robert T. Morris. Cloth. Price, $2.50. Pp. 256, with one illustration. Boston: Stratford Company, 1927.

The views of Dr. Robert T. Morris on any subject are always interesting because he is one of those citizens of the world who has a social mind. In his present volume he is concerned with the problems of the press. He feels, as do many other advanced thinkers, that the press is not fulfilling its duty to the public by featuring the news of crime and of sports and by apparently suppressing the news of health and of food and of similar matters which come much closer to the daily life of every man. Dr. Morris feels that sound editorials on the subject of nut growing on the front pages of every newspaper in the United States would soon bring the matter to the attention of all of the public. He feels that a discussion of the growing of vegetables or other farming problems could be made just as interesting and intense as any of the matters that now occupy the main attention of our daily press. Unfortunately, the actual experiment indicates that this opinion cannot be sustained. Newspapers must give to the public the things in which the public is interested. Any story to be successful must have a news angle. Educational matter is placed on separate pages with the clear understanding that it is educational, and thereby secures only the number of readers actually interested in such material. One of the difficulties of medical education of the public in the past has been that physicians wished to tell editors how to run their papers, and thereby neither the editors nor the physicians were benefited. The more modern physicians study the workings of the press and adjust themselves to those workings; thereby both medicine and the press are benefited. However, the press does not occupy all of the attention in Dr. Morris' book. It presents his views on agriculture, racial problems and many other subjects and, as has been said, his point of view is interesting although not necessarily practical.

UEBER DIE GEISTIGE ENTWICKLUNG HYPOTHYREOTISCHE KINDER BEI SPEZIFISCHER BEHANDLUNG. Von Dr. Med. et Phil Werner Kornfeld. Paper. Price, 2.70 marks. Pp. 38, with illustrations. Berlin: S. Karger, 1926.

On the basis of mental test, Kornfeld finds that glandular therapy has a beneficial influence on the mental as well as the physical development of children with hypothyroidism. However, he warns that a parallel improvement does not occur in all cases. Characteristic of the neurologist defending other drugs, he emphasizes correctly that the disrepute into which thyroid therapy has fallen is due to its abuse. Of greatest importance in the glandular treatment of hypothyroidism in children is the correct dosage as determined by Nobel and the necessity for its earliest possible and uninterrupted administration. This is half the battle. The rest consists of education, without which no medical management proves of much avail. In children in their teens as well as in earliest childhood there remains an injury to mental capacity, a slowness of association, and a lack of active attention with a consequent poverty of ideas. If such children are deprived of training, their store of knowledge deteriorates despite the most vigorous treatment. There is a greater necessity for training these children than normal children if the state charges are to be diminished, and the training of such individuals must be continued far beyond the time allotted to normal children. Furthermore, this training must be individualized and directed against the particular defect which manifests itself, such as speech retardation, difficulty with abstract subjects, inattention, and lack of initiative. In all stages it will be found that visual is far more impressive than auditory training.

THE LIFE AND WORK OF SIR PATRICK MANSON. By Philip H. Manson-Bahr, D.S.O., M.D., F.R.C.P., and A. Alcock, C.I.E., LL.D., F.R.S. Cloth. Price, $5.50. Pp. 273, with illustrations. New York: William Wood & Company, 1927.

It does one good to read the biography of a man like Sir Patrick Manson. He was the sort of person who warms the cockles of the heart: a vigorous, robust personality; an upstanding handsome young fellow and in his later years a fine looking old Britisher; a genial, friendly man; one who, throughout his life, was spurred on by the strongest scientific enthusiasm, and, withal, was an easy man of the world; a successful one; a hunter and a fisherman; a lover of the English countryside and of adventure. He was a rare compound of admirable and attractive qualities.

He came from a well-to-do Scotch family, was educated in the Scotch schools, and took his degree in medicine at the University of Aberdeen. He was not, outside of medicine, a university man. He graduated in 1865 when he was 21 years old, having finished his course more than a year before. A few months later, through the interest of an elder brother then in Shanghai, he obtained the appointment of medical officer for Formosa in the Chinese imperial maritime customs. This took him, in June, 1866, to Takao on the southwest coast of Formosa, where there were about sixteen other Europeans. Here he stayed nearly five years. Early in 1871 he transferred himself to the tropical Chinese town of Amoy, where he practiced for thirteen years. In 1883, at the age of 40, he left Amoy for Hong Kong, where he practiced until 1889. By 1889 he had accumulated sufficient property to enable him

to retire and he returned to England, expecting to continue untrammeled his scientific work and to live the life of a country gentleman. The depreciation of the Chinese dollar upset these plans and compelled him to resume practice in London in 1890. After a few years of struggle in London he was able to make the British appreciate, for the first time, the importance of tropical diseases to the British Empire, and by his knowledge of these diseases and his force he became the British leader in developing the field. He maintained this position until 1912, when his gout forced his formal retirement. Actually he remained the doyen of British tropical medicine until his death in 1922.

Manson's professional life, thus, divides itself into two parts: twenty-three years in the tropics, during which he accumulated his great knowledge of tropical diseases; then, an equally long active period, in London, where he studied and fostered the study of tropical medicine. He went to Amoy a young fellow of 22 years, with no knowledge whatever of tropical medicine. Immediately he began his study of the tropical diseases which obtruded themselves on him in such abundant numbers. He was indefatigable in his scientific interest. The thing that is perhaps most closely associated with his name is his work on filariasis. This gave him probably the clue to his mosquito theory. But there was no limit to his interest in the pathology of tropical diseases and no limit, except those of time and energy, to his study of them. Manson is a fine illustration of the fact that first-rate scientific investigators are likely to make themselves. His development was absolutely on his own initiative and under most adverse conditions. For fourteen years in Formosa and Amoy he was actually isolated from all scientific associates. Even on his rare trips to Great Britain he was not able to get in touch with scientific men. Added to these difficulties, until after he left Hong Kong he was engaged in an exacting miscellaneous practice, treating everything and doing all sorts of operations, even including those on the eye. In all these places he maintained an aggressive medical leadership. In Amoy he developed a large, useful hospital which actually went into decay and was abandoned after his departure. In spite of the difficulties of his situation and in spite of the utilization of his energies in everyday work, he was a scientific investigator of the first rank.

This is a brief outline of his stirring life; the story in detail as told by his biographers is well worth the reading by any one with scientific interest. It must be said that it is told in rather an involved way. The facts are all given in the biography, but it requires rather careful reading to get them in orderly shape in one's mind. In spite of this one finishes the reading with tremendous admiration for Manson as a man and as a scientist.

LEHRBUCH DER SPEZIELLEN CHIRURGIE FÜR STUDIERENDE UND AERZTE. Herausgegeben von Hofrat Prof. Dr. J. Hochenegg, Vorstand der II. Chirurgischen Klinik in Wien, und Geh. Med.-Rat. Prof. Dr. E. Payr, Direktor der chirurgischen Universitäts-Klinik in Leipzig. Erster Band. 1. Hälfte. Chirurgie des Kopfes, des Halses, der Brust, der Wirbelsäule, des Rückenmarkes und des Beckens. Erster Band. 2 Hälfte. Chirurgie der Brust, der Wirbelsäule, des Rückenmarkes und des Beckens. Second edition. Paper. Price, 36 marks. Pp. 1244, with 527 illustrations. Berlin: Urban & Schwarzenberg, 1927.

In the past decade the presentation of the subject of surgery has become an increasingly difficult task; so much so that the trend of modern teaching in this subject is toward a syllabus, which relegates to the text the function of giving the student a means of obtaining assignments and forming outlines, leaving him to obtain accurate and detailed information from current journals and monographs. To date it has been impossible to bring a text in surgery to the same pedagogic standards as have been obtained in our texts in medicine. The usual good and bad things can be said about the first volume of this "arbeit," which covers head, neck, chest and back. Judging from textbook standards, the chapters on the subject of the head are excellent; there is a complete outline of anatomy, physiology and pathology which makes these chapters the equivalent of a monograph on the head. The chapters on concussion, contusion and compression are worthy of especial mention. In spite of the extensive discussion devoted to the thyroid, the subject of hyperthyroidism is poorly handled, since it is obvious that these cases are commonly diagnosed only in the advanced form and little use is made of metabolic rate studies. An obvious reason, of course, is the great preponderance of benign over toxic thyroids in continental clinics. The chapters on lung, pleura and spine are good chapters, particularly lung suppuration and pleural empyema. The same objection may be leveled at the chapters on the breast as present in our own textbooks. It is poor pedagogy to present the clinical picture augmented by illustrations of malignancy so far advanced as to hold no surgical interest or indications. The work as a whole is too bulky for a textbook for the undergraduate to follow; more operative surgery is presented than the student can possibly learn or apply during his curriculum. As a textbook suggested for collateral reading of the worth-while chapters, but not to be followed in its entirety, is perhaps the fairest way to evaluate this surgery.

THE WAR ON MODERN SCIENCE. A Short History of the Fundamentalist Attacks on Evolution and Modernism. By Maynard Shipley, President, the Science League of American. Cloth. Price $3. Pp. 415. New York: Alfred A. Knopf, 1927.

The author, who is president of the Science League of America, traces here briefly and in a most interesting manner the fundamentalist attacks on evolution and modernism. Through Mississippi, Louisiana, North Carolina and through other Southern states, he proceeds to the shame of Tennessee, quoting from the press items which reveal that there is hardly a state in the United States that has not an unscientific fundamentalist group. The cases of such fundamentalists as Straton and Bryan are quite fully revealed, as well as the enlightened dictums of Fosdick and Jordan. For any one interested in the trend of American thought, this is a highly stimulating volume.

ALLGEMEINE KONSTITUTIONSLEHRE IN NATURWISSENSCHAFTLICHER UND MEDIZINISCHER BETRACHTUNG. Von O. Naegeli, o. ö. Professor der inneren Medizin an der Universität Zürich. Paper. Price, 9.60 marks. Pp. 118, with 114 illustrations. Berlin: Julius Springer, 1927.

This authority on blood gives us in these lectures many readable and stimulating observations of a clinician and a scholar: a personal presentation, yet free from unduly elaborate hypotheses. He regrets that medical men ignore zoology and botany, which have much to teach us about heredity, constancy of species, and method of development of new species or diseases. The true hereditability of this is to be proved by examining many generations, not a few, for persistent appearance of characteristic traits. New species or diseases occur, he believes, by sudden mutation rather than by gradual selection. To medical men probably the most interesting parts will be those dealing with constitutional (hereditary, endocrine) aspects of specific diseases, such as tuberculosis, grip, endocarditis lenta, hereditary hemolytic anemia with or without jaundice, pernicious anemia, chlorosis, hemophilia, and atrophic myotonia with or without cataract.

RÖNTGEN RAYS IN DERMATOLOGY. A Handbook for Practitioners and Students. By L. Arzt, M.D., and H. Fuhs, M.D., Professors at the Riehl Clinic for Dermatology and Syphilology, Vienna. Translated by C. Kevin O'Malley, M.C., M.B., B.A.O. Cloth. Price, $6. Pp. 202, with 57 illustrations. New York: William Wood & Company, 1927.

This is a good epitome of the therapeutic use of roentgen rays. In the first chapter it considers the physics in rather an elementary way and sometimes, it must be said, with statements that are superficial to the point of being inaccurate. Then roentgen-ray apparatus and technic are considered in three chapters covering fifty-three pages. These chapters give the technic of continental Europe and are particularly interesting for comparison with that which we use. On the whole, it is the old rather than the modern technic. This older technic has some advantages. On the other hand, it has certain disadvantages, of which no recognition is indicated. Then follow chapters on the biologic effects of radium or roentgen-ray injuries, their treatment and other aspects. The latter half of the book considers specifically the treatment of various dermatoses. The therapeutic uses recommended are those generally accepted. There is, however, an optimism about the benefits of roentgen rays in some conditions which would not be shared by all experienced workers. There are no severe criticisms to make of the book, but it is

not better than others of our works which have the advantage of describing apparatus that is standard in this country and technics which are more familiar to the American users of roentgen rays. The price seems unduly high for a book of its size.

Books Received

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for more extensive review in the interests of our readers and as space permits. Books listed in this department are not available for lending. Any information concerning them will be supplied on request.

EPIDEMIC CATARRHAL JAUNDICE. Some Notes on the Epidemiology of the Disease and an Account of an Epidemic in the Midlands. By M. T. Morgan and H. C. Brown. Reports on Public Health and Medical Subjects. No. 42. Price, 9d. net. Pp. 28, with illustrations. London: His Majesty's Stationery Office, 1927.

Report of epidemic and of failure to determine etiology.

CHIRURGIE DE L'OEIL ET DE SES ANNEXES. Par F. Terrien, professeur de clinique ophtalmologique à la faculté de médecine de Paris. Third edition. Paper. Price, 100 francs. Pp. 646, with 565 illustrations. Paris: Masson & Cie, 1927.

French textbook of ophthalmic surgery as poorly printed and as badly illustrated as usual.

LA COLLAPSOTHÉRAPIE DE LA TUBERCULOSE PULMONAIRE. Pneumothorax artificiel. Interventions chirurgicales. Par Michel Léon-Kindberg, médecin des Hôpitaux de Paris. Paper. Price, 15 francs. Pp. 160, with illustrations. Paris: Masson & Cie, 1927.

Brief monograph on artificial pneumothorax in tuberculosis.

LE TRAITEMENT DES VARICES PAR LES INJECTIONS LOCALES SCLÉROSANTES. Par J. A. Sicard, médecin de l'Hôpital Necker et Dr. L. Gaugier, licencié ès sciences. Paper. Price, 12 francs. Pp. 100, with illustrations. Paris: Masson & Cie, 1927.

French manual on injection treatment of varicose veins.

KIND UND ELTERHAUS. Eine Stimme-aus Amerika. Von Dr. B. Liber. III. Band von Menschenbildung und Menschheitsgestaltung. Herausgegeben von Paul Oestreich. Boards. Pp. 172. Berlin: Hensel & Company, 1927.

Reprint of an American opus of little importance.

CLINIQUE MÉDICALE DES ENFANTS. Affections de l'appareil urinaire. Par P. Nobécourt, Professeur de clinique médicale des enfants à la faculté de médecine de Paris. Paper. Price, 40 francs. Pp. 345, with illustrations. Paris: Masson & Cie, 1927.

L'ÉTAT ACTUEL DE L'ÉTUDE DES RÉFLEXES. Par M. Minkowski, professeur à l'Université de Zurich. Traduit de l'allemand par le Dr. Henri E Y, interne des Asiles de la Seine. Paper. Price, 12 francs. Pp. 75. Paris: Masson & Cie, 1927.

ÉTUDES SUR LA CIRCULATION DE L'INFLUX NERVEUX DANS L'ARC REFLEXE. Par A. Radovici, docent de neurologie à la faculté de médecine de Bucarest. Paper. Price, 16 francs. Pp. 107, with 27 illustrations. Paris: Masson & Cie, 1927.

NOMENCLATURE OF DISEASES AND OPERATIONS. By T. R. Ponton, B.A., M.D., Superintendent of Hollywood Hospital. Endorsed by the American College of Surgeons. Paper. Price, $2. Pp. 143. Chicago: Physicians' Record Company, 1927.

CONCEPTO SINTÉTICO ACTUAL DE LA FISIO-PATOLOGÍA DE LAS SECRECIONES INTERNAS. Por el Dr. José María González Galván, professor por oposición de la Beneficencia Municipal de Sevilla. Paper. Pp. 63. Seville, 1927.

PHYSICAL DIAGNOSIS. By Richard C. Cabot, M.D., Professor of Medicine in Harvard University. Ninth edition. Cloth. Price, $5. Pp. 536, with 285 illustrations. New York: William Wood & Company, 1927.

ALMANACH D' "O PENSAMENTO" PARA 1928. Scientifico, astrologico, philosophico, e literario. Ornado de numerosas gravuras. Decimo sexto anno. Paper. Pp. 288. São Paulo, 1927.

VERHANDLUNGEN DER JAPANISCHEN GESELLSCHAFT FÜR INNERE MEDIZIN. 23. Jahresversammlung gehalten zu Tokyo. vom. 2.—April 4, 1926. Paper. Pp. 125. Tokyo, 1926.

ANNUAL REPORT OF THE INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR, FEDERATED MALAY STATES, 1926. Paper. Pp. 61. Kuala Lumpur, 1926.

EL ALUMBRAMIENTO NORMAL Y SU PATOLOGIA. Paper. Pp. 148, with 24 illustrations. Madrid: Javier Morata, 1927.

Medicolegal

Delay in Giving Insurer Notice of Malpractice

(Fidelity and Casualty Co. v. Rosenheimer et al. (U. S.), 17 Fed. R. (2d) 961)

The United States Circuit Court of Appeals, seventh circuit, in reversing a judgment for $10,250 recovered by the defendants in error, says that the judgment was predicated on two indemnity insurance policies, one of which insured the defendants in error, two physicians, while the other covered a hospital which was a Wisconsin corporation conducted by the physicians. The policy running to the hospital provided "against loss from the liability imposed by law upon the assured for damages on account of bodily injuries or death suffered by any patient . . . at the hospital . . . in consequence of any malpractice, error, or mistake made while this policy is in force," etc. The policy covering the individuals was very similar. Each was for $5,000.

In March, 1922, while the policies were in force, the physicians performed an abdominal operation on a woman and left a gauze sponge about ten inches square in the patient's abdomen. July 20, another physician wrote to the defendants in error that he had that day found in the abdominal cavity of the woman a gauze sponge, assuring them that nothing had been said to the patient in regard to finding this foreign body, and saying "We will leave it to you to do as you see fit about informing the patient." Oct. 31, 1923, the patient and her husband sued the defendants in error individually and as doing business under the firm name and style of the hospital, for malpractice. Nov. 5, 1923, the physicians gave the insurer notice that a malpractice suit had been instituted against them; and on December 8 it informed the physicians that it was handling the matter under a full reservation of all the rights of the company until it had an opportunity to investigate the case fully, which was because of the delay in notifying the company of the claim being made against the physicians. March 31, 1924, the company returned to the physicians the summons and complaint in the action for malpractice, declining to cover the case because of the delayed notice. Thereafter the physicians employed other counsel and confessed judgment for $8,000 in favor of the patient and for the sum of $2,000 in favor of the husband. This suit was then instituted against the insurer for indemnity under the policies.

There was in the insurance policies a provision that "in case the assured becomes aware of any malpractice, error or mistake covered hereunder, or any alleged malpractice, error or mistake, the assured shall give immediate written notice thereof with the fullest information obtainable at the time to the company at its home office," etc. In this action by the physicians on the policies the company relied on their failure to give notice called for in the policies, while the physicians insisted that the company waived the giving of such notice by taking charge of the malpractice litigation, and for nearly five months conducting the defense, with full knowledge that the physicians had failed to give such notice. Many cases may be found that hold the insurer may and does ordinarily waive the giving of such notice by taking charge of the litigation. Few of them, however, consider the effect of an attempted reservation, such as the company made by its letter of December 8. But all of them recognize that the insurer must have knowledge of all the material facts before its conduct can constitute a waiver.

The action of the district court in directing a verdict in the physicians' favor was necessarily predicated on one of two assumptions, either that the evidence showed conclusively that the company knew all the material facts respecting the physicians' failure to give this written notice, or that the evidence showed conclusively that the physicians were not obligated to give the company any written notice prior to the commencement of the damage action against them. From all the evidence the circuit court of appeals is of the opinion that both these questions were for the jury. It might be true that the company early learned of the physicians' failure to give it written notice of the substance of the letter of July 20. But there was other material information respecting the

alleged malpractice which the company did not receive until later. In fact, the long time that elapsed between the date of the operation and the commencement of the malpractice action added to the burdens of the investigation, and left the question of whether any written notice was required doubtful and uncertain. Until the company received this information, which, of necessity, had to come to it largely from or through the physicians, its action in conducting the defense could not be said as a matter of law to have been a complete waiver. In other words, the question was one for the jury. While it may be true that physicians, in a case like this, are not required to give notice of their "malpractice, error, or mistake" on the receipt of every bit of hearsay information that may reach them, the evidence in this case demanded that this question be submitted to the jury.

Equipment of Physician's Private Hospital Not Exempt

(De Coster v. Nenno et al. (Minn.), 213 N. W. R. 538)

The Supreme Court of Minnesota says that the plaintiff was a practicing physician and surgeon who maintained in the business part of the city an office which he had fitted up with the usual furnishings and equipment of a physician's office. He also owned in the city a building of twenty rooms which he operated as a private hospital. He occupied certain of the rooms as a residence, but the majority of them were used solely for hospital purposes and the accommodation of patients. One of the defendants having obtained a judgment against him, the other defendant, as sheriff, levied on the furniture and equipment in that part of the plaintiff's building used as a hospital, the levy being under an execution issued on the judgment. Thereupon the plaintiff brought this action to enjoin the defendants from selling or removing the property so levied on, claiming it as exempt under the provision of the Minnesota statute which exempts "the library and implements of a professional man" from sale on execution. The trial court held that part of the property levied on was exempt and that part of it was not, and directed judgment enjoining the defendants from seizing or removing the property specified as exempt.

The supreme court finds no sufficient ground for saying that a part of this property levied on was exempt and a part not exempt, for it was all devoted to hospital purposes. There was no controversy as to the nature of the property or the purpose for which it was used. The question presented and argued was whether the statute exempting "the library and implements of a professional man" is broad enough to include the equipment of a hospital owned and operated by a practicing physician and surgeon. Although the attorneys had apparently made diligent search, they were unable to cite any authority so holding, and this court has found none. This court finds no case in which the claim here asserted has ever been made or discussed, which is persuasive that such property has always been considered as not within such an exemption.

The state constitution, article 1, section 12, provides that "a reasonable amount of property shall be exempt from seizure or sale for the payment of any debt or liability. The amount of such exemption shall be determined by law." This provision requires that the exemption shall be reasonable in amount. While the statute defining exemptions is to be liberally construed, it would be going beyond any reasonable construction to hold that the legislature, in specifying "the library and implements of a professional man" as exempt, intended to exempt the equipment, apparatus and appliances of a hospital. Fitting up a hospital in the modern way is expensive, and a wealthy man could invest his entire wealth in such property. The legislature has made a lengthy list of the property and the classes of property which are exempt from seizure for debt, and, if it had intended to exempt such property as that in question, the court thinks that it would have indicated such intention in some definite manner, and that the expression "implements of a professional man" was not intended to embrace such property and cannot be extended to do so by the courts.

It was argued that small private hospitals are a convenience if not a necessity in small communities, and enable a physician to extend his service and usefulness. This is doubtless true, but, if hospitals could be deemed to be within the present law, there is no limit to their size or to the amount of money that might be invested in them.

The supreme court reaches the conclusion that the property in question was not exempt.

Mental Capacity to Contract—Weight of Testimony

(Price's Executor v. Barham (Va.), 137 S. E. R. 511)

The Supreme Court of Appeals of Virginia, in affirming a decree in favor of the defendant in this suit to set aside a contract on account of alleged mental incapacity and undue influence, says that, owing to the difference in the facts, one case affords but little aid in arriving at a correct conclusion in another. Each one must be decided on its own facts and circumstances. While evidence of mental incapacity shortly before or after the principal event is admissible because it throws light on the probable mental condition at the time of event, still the crucial time at which capacity must exist is the time of the factum—the time at which the act complained of was done. If mental capacity at that time is satisfactorily shown, it is immaterial what the capacity was before or after that time. In the determination of that question, however, the same weight is not attached to the testimony of all classes of witnesses.

The testimony of attesting witnesses to documents and of others present at their execution is entitled to peculiar weight. Physicians also, it is held, occupy a high grade on the question of mental capacity, both because they are generally men of cultivated minds and observation, and are supposed to have turned their attention to such subjects and because they are able to discriminate more accurately than lay witnesses, and this is especially true of a family physician who has attended the patient through the disease which is supposed to have disabled his mind. On the other hand, the testimony of lay witnesses as to the sanity of a person is dependent on their capacity to judge and their opportunity for making observations. When they have made such observations, they may give their opinions based thereon as to mental capacity, but usually the extent of the observations has been so limited, and the character of them so indefinite or inconclusive, as not to entitle them to very great weight or consideration.

The degree of capacity necessary to make a bilateral contract, where mind clashes with mind, is probably a little greater than that required for a unilateral contract, or a will; but, if a party has sufficient mental capacity to understand the nature and effect of the transaction, to assent to its provisions and to know that his act is irrevocable, his contract is valid.

Undue influence is a species of fraud, and, like all other fraud, must be clearly proved; but the proof need not be direct. It may be circumstantial. It will not be inferred, but the circumstances attending a transaction may be such as to lead to the conclusion of fraud as inevitably as direct proof.

How a Jury May Deal with Expert Testimony

(Metropolitan Life Ins. Co. v. Shaw (Ala.), 112 So. R. 179)

The Court of Appeals of Alabama, in affirming a judgment in favor of Julia Shaw, as administratrix, on a policy of life insurance, says that the principal questions were: Did the insured represent to the defendant as a basis for the policy that he had never had pleurisy or tuberculosis, in such manner as to bind him? And, if so, was there evidence from which the jury could infer that he did not have pleurisy in 1922, or tuberculosis on March 28, 1925? With due regard for the testimony of the expert witnesses testifying in the case and the credit to be given their opinions, the courts of Alabama hold to the rule that the jury may deal with such testimony as it sees fit, not to reject it capriciously but to weigh it in the light of common sense, common reason and the common experience of men, in connection with all the facts and circumstances in the case. The testimony of the physicians testifying in this case was a fair illustration of the correctness of this rule and the uncertainty of expert testimony when dealing with human diseases of the body.

The testimony of one physician to the effect that the insured was treated by him for pleurisy in 1922 was a mere opinion

by him that the insured had the disease at the time he was treated, but if the testimony of Julia Shaw was true, that the "insured did not have pleurisy in 1922, that she knew of, and that she would have known it if he had, and that she lived in the same house with him during that year," and, as testified to on behalf of the plaintiff, that the insured was not sick during 1922, and did not become ill until June before he died on July 21, 1925, but was constantly at his work and about his usual occupation, then the physician must have been mistaken. This was a question for the jury.

As to whether the insured had tuberculosis on March 28, 1925, was also a jury question: The physician who made the examination for the defendant company certified to the good health of the insured in March, 1925, just prior to the issuance of the policy on March 30, 1925. March 28, another physician examined the insured and at that time was not sure that the insured had tuberculosis, a laboratory examination of the sputum did not confirm a diagnosis of tuberculosis, and the other symptoms found "might have been the result of diseases other than tuberculosis." The opinion of the physician that the insured had tuberculosis was based on the condition of the insured on March 28, coupled with the fact that he died of tuberculosis, July 21. This witness certified that the duration of the last sickness was two months. He testified that negroes yielded to tuberculosis more readily than white people. The mother of the insured testified that he was ill only four or five weeks before he died; that he was not sick until the middle of June. From the facts adduced the jury could infer that the insured did not have tuberculosis on March 28, 1925. The facts on both questions presented by this record were sufficient to make this a jury case and to warrant the court in refusing to defendant the general charge as requested. Nor was there error in overruling the defendant's motion for a new trial.

Examiner of Employee as Witness—Waiver of Privilege

(Montzoukos v. Mutual Ben. Health & Accident Ass'n (Utah), 254 Pac. R. 1005)

The Supreme Court of Utah says that in this action on an accident insurance policy wherein the plaintiff alleged that he had sustained bodily injuries through purely accidental means by rupturing himself while attempting to unload a mining timber too heavy for one man to handle, the defendant alleged that at the time of the plaintiff's application for the policy, and at the time of the alleged accident, he was afflicted with hernia, and that that was the sole cause of any illness that he may have had. After the plaintiff had testified that prior to the time that he went to work for the mining company he had been examined by its physician as to his physical condition, and was given a card passing him as physically fit to go to work at the mine, the defendant called the physician as a witness. When the physician was asked to state what he found from the examination when he went over the plaintiff's lower abdomen, objection was made that it was a privileged communication and barred under the provision of the Utah statute that "a physician or surgeon cannot, without the consent of his patient, be examined in a civil action, as to any information acquired in attending the patient which was necessary to enable him to prescribe or act for the patient." The evidence without dispute showed that the physician was employed by the mining company in the particular instance to pass on the plaintiff's physical fitness for work. He was not employed to treat the plaintiff or to examine him for the purpose of treatment. The question therefore was, Did the statute relied on apply? It seems clear from the very words of the statute, without reference to adjudicated cases, that the relation of physician and patient did not exist between the physician and the plaintiff, and therefore the trial court erred in sustaining the plaintiff's objection to the question. Furthermore, in view of the issues raised by the pleadings, the error was manifestly prejudicial.

But, assuming that the relation of physician and patient did exist, the supreme court is still of the opinion that the trial court erred in sustaining the objection. The plaintiff in his examination in chief testified that the physician passed him as physically fit for the work, gave him a card, and sent him to work. Not satisfied with that answer, the further questions were propounded, as to whether he meant that the physician passed him as physically fit to go to work at the mine, and whether he worked there until he was injured; to both of which he answered "Yes, sir." In making these answers the plaintiff made use of the opinion of the physician as to his physical condition, his ailments, if any, and left the impression, no doubt, on the jury that he was physically sound and healthy. He thereby acquired an advantage to which he was not entitled, if he intended to claim the privilege of the statute; and the supreme court is of the opinion that he waived the privilege of the statute. Here the plaintiff voluntarily stated, in effect, what the physician said on a point going to the very root of the issues between the parties. In such case the physician whose conclusions and opinions were exploited by the plaintiff, for an obvious advantage, should be permitted to state what he found on the examination to which the plaintiff referred. The rejection of the evidence was prejudicial error.

Again, the supreme court says that, in view of the fact that the relation of physician and patient did not exist, within the meaning of the privilege statute, the physician should have been permitted to answer any competent, relevant and material question as to what he found when he examined the plaintiff as to his physical fitness for work.

On the other hand, the plaintiff did not waive the privilege of the statute when, nearly three months after the alleged accident, and without any consideration for such agreement appearing, he signed what was called an "affidavit of claimant as to illness," in which he was asked the question, "Do you agree that any physician who has ever treated you may give information within his knowledge as to your past or present physical condition?" to which he answered, "Yes." His willingness to allow any physician who had ever treated to give information within his knowledge as to the plaintiff's past or present physical condition should not be construed as a consent that the physicians might testify to such information against the plaintiff in an action to recover on the policy. Such an interpretation of the language used would violate the rule that doubtful provision should be construed in favor of the insured.

Society Proceedings

COMING MEETINGS

American Association of Railway Surgeons, Chicago, November 2-4. Dr. Louis J. Mitchell, 29 East Madison Street, Chicago, Secretary.

American College of Surgeons, Detroit, October 3-7. Dr. Franklin H. Martin, 40 East Erie Street, Chicago, Director-General.

American Hospital Association, Minneapolis, Oct. 10-14. Dr. William H. Walsh, 18 East Division Street, Chicago, Executive Secretary.

American Public Health Association, Cincinnati, Oct. 17-20. Mr. Homer N. Calver, 370 Seventh Avenue, New York, Executive Secretary.

American Society of Tropical Medicine, Boston, October 21-22. Dr. B. Schwartz, P. O. Box 131, Pennsylvania Avenue Station, Washington, D. C., Secretary.

Association of American Medical Colleges, Montreal, October 24-26. Dr. F. C. Zapffe, 25 East Washington Street, Chicago, Secretary.

Association of Military Surgeons of the United States, Carlisle Barracks, Pennsylvania, October 6-8. Dr. J. R. Kean, Army Medical Museum, Washington, D. C., Secretary.

Central Neuropsychiatric Association, St. Paul, October 7-8. Dr. Karl A. Menninger, Mulvane Building, Topeka, Kan., Secretary.

Central States Pediatric Society, Cleveland, Oct. 14-15. Dr. H. T. Price, Westinghouse Building, Pittsburgh, Secretary.

Delaware State Medical Society, Farnhurst, Oct. 11-12. Dr. W. O. La Motte, Industrial Trust Building, Wilmington, Secretary.

Inter-State Post Graduate Medical Association of North America, Kansas City, Mo., October 17-21. Dr. W. B. Peck, 82 Stephenson Street, Freeport, Ill., Managing Director.

Kentucky State Medical Association, Owensboro, October 3-6. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.

New York and New England Association of Railway Surgeons, New York, Oct. 21-22. Dr. Horace H. LeSeur, 41 Jackson Street, Batavia, N. Y., Secretary.

Ohio Valley Medical Association, Evansville, Ind., November 9-10. Dr. J. F. Wynn, 712 South 4th Street, Evansville, Ind., Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, Oct. 3-6. Dr. Walter F. Donaldson, Jenkins Arcade, Pittsburgh, Secretary.

Southern Medical Association, Memphis, Tenn., November 14-17. Mr. C. P. Loranz, Empire Building, Birmingham, Ala., Secretary.

Vermont State Medical Society, Middlebury, Oct. 13-14. Dr. W. G. Ricker, 29 Main Street, St. Johnsbury, Secretary.

Virginia, Medical Society of, Petersburg, Oct. 18-20. Miss Agnes V. Edwards, 104½ West Grace St., Richmond, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Anatomy, Philadelphia

39: 355-488 (July 15) 1927

George Summer Huntington. C. F. W. McClure, Princeton, N. J.—p. 355.
Development of Palatine Tonsil. B. F. Kingsbury and W. M. Rogers, Ithaca, N. Y.—p. 379.
Comparative Histology of Lymph Nodes of Rabbit. H. E. Jordan and J. B. Looper, Charlottesville, Va.—p. 437.
Thyroid Apparatus: XLI. Rôle of Thyroid and Parathyroids in Growth of Submaxillary Glands. F. S. Hammett, Philadelphia.—p. 463.
Id.: XLII. Rôle of Thyroid Apparatus in Growth of Eyeball. F. S. Hammett, Philadelphia.—p. 477.

American J. Obst. & Gynec., St. Louis

14: 1-136 (July) 1927

*Changes in Metabolism: Relation to Treatment of Vomiting of Pregnancy. W. J. Dieckmann and R. J. Crossen, St. Louis.—p. 3.
Cirsoid Aneurysm of Uterus. W. P. Graves and G. van S. Smith, Boston.—p. 30.
Dystocia Caused by Hemangioma (Chorioangioma) of Placenta. L. A. Emge, San Francisco.—p. 35.
*Twin Pregnancy After Temporary Suppression of Menstruation Following Roentgen-Ray Treatment for Mammary Cancer. I. I. Kaplan, New York.—p. 40.
Diagnosis of Rachitic Pelves by Roentgen Ray. H. Thoms, New Haven, Conn.—p. 45.
*Case of Osteogenesis Imperfecta in Twins. W. E. Welz and B. L. Lieberman, Detroit.—p. 49.
Continuous Endobronchial Aspiration for Pulmonary Edema Complicating Eclampsia. W. F. Moore and J. S. Lawrence, Philadelphia.—p. 55.
Case of Carcinoma of Female Urethra. W. S. Pugh, New York.—p. 57.
*Therapeutic Abortion by Roentgen Ray. D. D. Wyser and M. D. Mayer, New York.—p. 62.
*Female Genital Tuberculosis. A. V. Friedrichs, New Orleans.—p. 68.
Pelvic Infections: Analysis of 550 Operated Cases: Sedimentation Test in 100 Gynecologic Cases. W. T. Black, Memphis, Tenn.—p. 74.
Care of Breast and Its Complications During Pregnancy. P. J. Carter, New Orleans.—p. 81.
Proper Evaluation of Obstetric Case. W. E. Levy, New Orleans.—p. 84.
*Case of Vagitus Uterinus. F. Freed, New York.—p. 87.
*Fluctuation in Blood Sugar During Eclampsia: Relation to Convulsions. P. Titus, P. Dodds and E. W. Willetts, Pittsburgh.—p. 89.

Metabolism in Vomiting of Pregnancy.—Dieckmann and Crossen believe that systematic study of the metabolism in general, and particularly of the carbohydrates, together with a study of the acid-base balance of the body, will give more enlightenment as to the etiology, pathology and treatment of vomiting of pregnancy than speculations concerning "toxins" or deranged glandular function. Their results in a series of forty-eight cases, with none requiring abortion, show that the treatment of this condition has been greatly changed since the continuous use of large amounts of intravenous dextrose solutions have proved so successful.

Castration by Roentgen-Ray Therapy Not Permanent.—The case reported by Kaplan shows that castration by roentgen-ray therapy in women under 40 years of age may not be permanent. Small doses of roentgen ray may stimulate ovarian function, with subsequent pregnancy. Ova may not all be destroyed in roentgen-ray castration in young women. The nondestroyed ova may ripen and become pregnant even after a year following castration. Roentgen-ray therapy of the pregnant uterus kills the fetus and abortion is indicated.

Osteogenesis Imperfecta in Twins.—Welz and Lieberman report osteogenesis imperfecta occurring in single ovum twins. The first baby died in nine hours, the second in fourteen hours. Blood calcium determinations showed in the mother 8.9 and in the second baby 10.1. The blood Wassermann reaction was negative. A single roentgenogram of the entire body of the second baby showed a fracture of nearly every bone in the upper and lower extremities in various stages of healing; also healed fractures of most of the ribs on both sides. There was a marked deformity in both femurs as the result of healing in malposition. There was no evidence of injury to the spine. The clavicles appeared to have escaped injury. The epiphyses of the tibia on both sides showed a dense straight line of bone deposit. The first baby had a condition nearly identical. Both clavicles appear to have been fractured in this case.

Therapeutic Abortion by Roentgen Ray.—Twenty-two women, ranging in age from 19 to 42 years, were treated by Wyser and Mayer by means of the roentgen ray. In each instance there was absolute indication for therapeutic abortion after a most careful, exhaustive study from every angle. In practically all sterilization was the contraceptive of choice or necessity. The typical procedure consisted in giving from one to four treatments in the hospital. Abortion took place spontaneously. The discomfort was comparatively slight and the average bleeding was somewhat less than in a miscarriage from other causes. Occasionally it was necessary to remove the loose protruding ovum from the os by a mere twist of the forceps.

Tuberculosis of Female Genitalia.—Friedrichs's patient had evidently had a long standing tuberculous infection of the lungs, which, after the delivery of her child, flared up and spread throughout the entire body. The female genitalia presented the most unusual feature of the case. The ovaries showed an occasional miliary tubercle and a slight infiltration of polymorphonuclear neutrophils. The tubes showed an acute suppurative salpingitis with a marked studding of miliary tubercles and some conglomerate tubercles. The uterus was the most extensively involved of the genital organs, miliary and conglomerate tubercles and caseation being found throughout the entire structure. Associated with the tuberculous infection was a marked acute inflammation with abscess formation.

Vagitus Uterinus.—In Freed's case a pelvic examination made fourteen hours after the onset of labor revealed a fairly marked cystocele and a rectocele. The relaxed anterior vaginal wall prolapsed each time the patient had a bearing down pain. Air was distinctly heard to enter when the hand was introduced into the vagina. Two or three minutes later the child cried while still in the uterus so loudly that it was heard by another physician and a nurse in the delivery room at the time, and also by two physicians and a nurse in an adjoining room. Immediate examination of the fetal heart showed it to be distinct and regular, with 120 beats to the minute. Under ether, delivery was immediately carried out. While the head was being delivered the child cried several times. He was discharged with his mother in good condition fourteen days later, when he weighed 3,700 Gm.

Fluctuation in Blood Sugar During Eclampsia.—Titus, Dodds and Willetts assert that the views generally held regarding certain important blood chemistry changes in eclampsia are incorrect; moreover, they are prepared to furnish proof that (1) a disturbance in carbohydrate metabolism in eclampsia actually exists; (2) contrary to the general opinion, hyperglycemia is not characteristic of eclampsia, but (3) eclamptic convulsions are directly related to and the result of hypoglycemic levels during the course of this disease. With the view that the convulsions of eclampsia are to be designated as a hypoglycemic reaction or manifestation, the use of insulin with or without dextrose in the treatment of this disease is unnecessary and contraindicated. Intravenous injection of hypertonic dextrose solution has a definite basis for its proved therapeutic value.

American Journal of Physiology, Baltimore

81: 255-518 (July 1) 1927

*Influence of Physical Training on Basal Respiratory Exchange, Pulse Rate and Arterial Blood Pressure. E. C. Schneider, R. W. Clarke and G. C. Ring, Middletown, Conn.—p. 255.
Inorganic Constituents of Human Saliva: II. G. W. Clark and L. Levine, Berkeley, Calif.—p. 264.
Effect of Epinephrine on Phosphorus Partition in Muscle. J. Sacks, Chicago.—p. 276.
Effect of Epinephrine on Temperature of Skeletal Muscle. M. W. Caskey and E. J. Humel, Louisville, Ky.—p. 280.
*Effect on Rats of Long-Continued Ingestion of Zinc Compounds. K. R. Drinker, P. K. Thompson and M. Marsh, Boston.—p. 284.

Utilization of Dextrose, Levulose and Galactose by Animal and Plant Cells, and Antagonistic Action of Insulin to Thyroxin. W. E. Burge and M. Wiliams, Chicago.—p. 307.
Excretion of Water by Kidneys of Frogs. E. F. Adolph, New York.—p. 315.
*Effect of Follicular Hormone on Old Albino Rats. J. R. Slonaker, San Francisco.—p. 325.
Effect of Starvation on Daily Consumption of Water by Dog. N. Kleitman, Chicago.—p. 336.
Effect of Secretagogues on Chemical Composition of Pancreatic Juice. E. U. Still and O. W. Barlow, Chicago.—p. 341.
*Thyroid Apparatus: XLVII. Cyclic Character of Response to Parathyroid Deficiency. F. S. Hammett, Philadelphia.—p. 349.
Muscular Rhythms and Action Currents. L. E. Travis and T. A. Hunter, Iowa City.—p. 355.
Relation of T Wave to Asynchronism Between Ends of Right and Left Ventricular Ejection. L. N. Katz and S. F. Weinman, Cleveland.—p. 360.
Muscle Glycogen as Source of Blood Sugar. S. Soskin, Toronto.—p. 382.
*Prevention of Tetany by Oral Administration of Magnesium Lactate. W. F. Wenner, New Haven, Conn.—p. 392.
Morphine Intoxication in Epinephrinectomized Rats. T. Torino and J. T. Lewis, Buenos Aires.—p. 405.
Sensitiveness of Epinephrinectomized Rats to Certain Toxic Substances. C. A. Crivellari, Buenos Aires.—p. 414.
*Regulation of Flow of Bile: III. Rôle of Gallbladder. G. E. Burget, Chicago.—p. 422.
Action of Choline on Alimentary Canal of Intact Dogs. A. J. Carlson, E. A. Smith and I. Gibbins, Chicago.—p. 431.
Hemodynamic Action of Subcutaneously Injected Epinephrine: I. Conditions Under Which Hypodermically Administered Epinephrine Gives Pressor Effect. A. B. Luckhardt and T. Koppányi, Chicago.—p. 436.
*Alleged Antagonistic Action of Internal Secretions of Pancreas and Thyroid. H. Wolfson, Chicago.—p. 453.

Effects of Physical Training.—The effects of physical training were studied by Schneider, Clarke and Ring during the pretraining, training and posttraining periods. During the period of training the basal metabolism declined in three and was unchanged in two subjects. In the posttraining period it returned to the pretraining rate. The basal minute-volume and frequency of breathing were not affected by training. Training slowed the basal and early morning standing posture pulse rate, but did not affect the early morning arterial blood pressure.

Effect of Ingestion of Zinc Compounds.—Drinker, Thompson and Marsh have never observed any significant clinical symptom nor obtained any significant laboratory evidence of damage resulting from the daily ingestion by rats, during long periods of time, of zinc oxide, zinc acetate, zinc citrate or zinc malate. Gross and histologic examination of tissues following autopsy has shown in the organs of rats treated with zinc no damage of any sort attributable to zinc. Studies on zinc excretion both in control and in zinc-fed rats indicate that a small fraction of absorbed ingested zinc leaves the body in the urine but that the main bulk of it is excreted through the gastro-intestinal tract. Rats are able to excrete as much zinc as they ingest, even when the zinc dose is very large. This fact is true whether the ingested zinc be an organic zinc compound or the more insoluble zinc oxide.

Effect of Follicular Hormone.—The results of Slonaker's experiments indicate that the hormone does not prolong the productive sexual life of the animal by inciting ovulation but that it may stimulate mating activities. As a result of the hormone injections, the majority of the animals showed a reduction in food consumption and spontaneous activity accompanied by an increase in body weight. This effect was of short duration, and a return to normal in a short time usually occurred. All results indicate that the effect of the injected hormone is but transitory, lasting only a few days at most.

Response to Parathyroid Deficiency.—An interpretation is suggested by Hammett of the sequence of events and other phenomena exhibited in conditions of parathyroid deficiency based on the idea that the parathyroid glands subserve two functions, that of participation in the regulation of the calcium balance, and that of the prevention of the accumulation of toxic tetany producing compounds within the organism. A possible seasonal difference in sensitivity to parathyroid deficiency is indicated.

Magnesium Lactate Prevents Tetany.—Experiments made by Wenner on dogs have shown that the continuous oral administration of magnesium lactate is an effective agent in the prevention of tetany in parathyroidectomized animals. Magnesium tends to keep the calcium content of the blood serum above the tetany level. It is suggested that magnesium, by uniting with the excess phosphorus, keeps the calcium in solution. The sedative effect of magnesium greatly reduces the excitability of the central nervous system whereby the more violent symptoms of tetany are held in check. Magnesium-treated thyroparathyroidectomized dogs, kept free from tetany for about forty days, become readjusted to the loss of the parathyroids and may permanently recover and may be placed on a full meat diet without ill effects. The lactates of cadmium, sodium and potassium were found to be ineffective in preventing or relieving tetany.

Rôle of Gallbladder.—The theory of a reciprocal activity between the gallbladder and the sphincter of Oddi that brings about expulsion of bile, Burget says, seems to have no experimental basis. The gallbladder is incapable of contractions that might be construed as being of major importance in the flow of bile. Evidence that the gallbladder plays only a passive rôle in bile flow further confirms the conclusion that this process is regulated by tonicity and peristalsis of the duodenum, with elasticity of the gallbladder and intra-abdominal pressure as auxiliary factors.

Antagonism of Pancreas and Thyroid Secretions.—Wolfson did not obtained disappearance of the signs and symptoms of diabetes following thyroparathyroidectomy. The blood sugar levels of the animals either remained at the same diabetic level or showed a slight increase, but in no case was there a tendency for the hyperglycemia to diminish.

Boston Medical and Surgical Journal

197: 79-118 (July 21) 1927

Specific Medication in Tuberculosis; Chemotherapy. E. R. Baldwin, Saranac Lake, N. Y.—p. 79.
Effect of Operation on Vital Capacity. J. R. Head, Chicago.—p. 83.
*Enventration of Left Diaphragm. F. E. Wheatley, Boston.—p. 87.
*Treatment of Ankle Sprains. C. P. Hutchins, Syracuse, N. Y.—p. 91.
Relationship of Weather to Incidence of Pneumonia in Children's Hospital, Boston. L. W. Hill, Boston.—p. 93.

Eventration of Left Diaphragm.—Wheatley's patient complained of palpitation of the heart on exertion, progressive weakness and indefinite pain extending from the right hypochondrium, through the chest and down the right arm. She also became constipated and suffered from flatulence. Clinical examination did not reveal anything of importance, except possibly the heart dulness, extending farther to the right than usual. The fluoroscopic examination of the chest showed an eventration of the left diaphragm which had previously escaped detection. Wheatley believes that this was a congenital defect and that advancing age, with a general lowering of tone and digestive secretions, resulted in fermentation and flatulence which would explain practically all the symptoms.

Treatment of Ankle Sprains.—The essential of Hutchins's method is the posture of the foot in relation to the lower leg. The patient is seated on a table at such level that his depending foot hangs from 6 to 8 inches lower than the knee of the operator, who sits facing him. With adhesive straps 1½ inches wide cut to length, the patient's foot is placed on the operator's knee so that the ankle is dorsally flexed to 80 or 85 degrees from the long axis of the tibia and rests the full weight of the extremity on the head of the fifth metatarsal. The patient's leg must be wholly passive. This leaves the leg in straight alinement from hip to ankle joints and throws the foot into slight eversion. The first strap runs spirally round the lower calf on the medial side, across the instep and cuboid, under the sole, falling into a natural sweep on the dorsum. This is the salient control of the hypermobility. The second strap is a third support in a stirrup from the middle of the calf and passes in the lateral plane of the ankle joint. The fourth and narrow strip retains the third support in contact with the leg at its isthmus above the malleolei. It is imperative that the patient's leg be maintained in the same posture throughout the dressing and his muscle action inhibited. Walking is instituted at once with the foot carried in the four-square position—straight ahead. When perspiration permits the plaster to

slip so that the angle between the foot and leg exceeds 90 degrees, the dressing must be reapplied. Otherwise no other treatment has been found necessary.

California and Western Medicine, San Francisco

26: 593-736 (May) 1927

Evolution of Organized Medicine. W. T. McArthur, Los Angeles.—p. 625.
Medical Problems, Old and New. P. T. Phillips, Santa Cruz.—p. 629.
Congenital Cleft Lip and Palate. J. H. Woolsey, San Francisco.—p. 633.
Fourth Year Medical Student and His Life Work. J. B. Manning, Santa Barbara.—p. 637.
*Rectal Analgesia in Obstetrics. L. G. McNeile and J. Vruwink, Los Angeles.—p. 640.
George Chismore. D. W. Montgomery, San Francisco.—p. 644.
Roentgen Ray and Conservative Surgery in Treatment of Malignant Tumors of Testicle and Scrotum. M. B. Wesson, Manila, Ark.—p. 648.
Pernicious Anemia. A. E. Mark, Los Angeles.—p. 650.
Restoration of Auricle. J. P. de River, San Francisco.—p. 654.
Acute Necrosis of Liver: Case. A. C. Reed and I. W. Thorne, San Francisco.—p. 657.
Complete Recovery from Lung Abscess Following Removal of Foreign Body from Bronchus: Case. G. Cheney, San Francisco.—p. 658.
Toxic Reactions from Phenobarbital (Luminal): Two Cases. H. J. Bollinger, San Francisco.—p. 659.

Rectal Analgesia in Labor.—McNeile and Vruwink have substituted diallylbarbituric acid, 3 grains (0.2 Gm.), by hypodermic for the morphine-magnesium sulphate in more than 200 patients. One ampule containing 3 grains of the drug is given by hypodermic when the cervix is dilated from two to three finger breadths and contractions are occurring at intervals of from three to five minutes. If relief is not obtained in from fifteen to twenty minutes, the rectal instillation is given. No magnesium sulphate is used. The same treatment may be repeated in three to four hours. The effect sets in quite rapidly—as a rule in from fifteen to twenty minutes. The patient becomes somewhat sleepy, and this effect is increased after the administration of the rectal instillation. The tendency to sleep between the pains becomes very pronounced. In nearly all patients the strength of the uterine contractions is increased and the interval decreased. The most pronounced effect has been on the cervix. In over 80 per cent of the patients there has been an almost immediate relaxation of the cervix and very rapid dilatation. The rapid relaxation and dilatation has been particularly noticeable in those patients with marked rigidity of the cervix so often found in elderly primiparas.

Journal of Experimental Medicine, Baltimore

46: 1-204 (July 1) 1927

Surface Tension of Serum: XV. Thickness of Monolayer of Rabbit Plasma. P. L. du Noüy, New York.—p. 1.
*Method for Direct Observation of Experimental Extracorporeal Thrombus Formation: I. L. G. Rowntree and T. Shionoya, Rochester, Minn.—p. 7.
*Id.: II. Thrombus Formation in Normal Blood in Extracorporeal Vascular Loop. T. Shionoya, Rochester, Minn.—p. 13.
*Id.: III. Effects of Certain Anticoagulants (Heparin and Herudin) on Extracorporeal Thrombosis and on Mechanism of Thrombus Formation. T. Shionoya, Rochester, Minn.—p. 19.
*Diet and Tissue Growth: V. Effect of Dietary Protein on Remaining Kidney of Adult White Rats Following Unilateral Nephrectomy. T. S. Moise and A. H. Smith, New Haven, Conn.—p. 27.
Cell Respiration Studies: I. Microspirometer for Continuous Study of Oxygen Absorption by Living Cells. B. C. Wilbur, G. A. Daland and J. Cohen, Boston.—p. 43.
Id.: II. Comparative Study of Oxygen Consumption of Blood from Normal Individuals and Patients with Increased Leukocyte Counts (Sepsis; Chronic Myelogenous Leukemia). G. A. Daland and R. Isaacs, Boston.—p. 53.
Effect of Host Immunity to Filtrable Virus (Virus III) on Growth and Malignancy of Transplantable Rabbit Neoplasm. L. Pearce and T. M. Rivers, New York.—p. 65.
Effect of Filtrable Virus (Virus III) on Growth and Malignancy of Transplantable Neoplasm of Rabbit. L. Pearce and T. M. Rivers, New York.—p. 81.
Immunologic Properties of Typical (S-Producing) and Degraded (Non-S-Producing) Strain of Type II Pneumococcus with Special Reference to Protective Antibodies. E. L. Gaspari, W. L. Fleming and J. M. Neill, Nashville, Tenn.—p. 101.
*Factors Involved in Infection of Mice After Vaccination with Type II Pneumococci. J. M. Neill and E. L. Gaspari, Nashville, Tenn.—p. 113.
Pathogenic B. Coli from Bovine Sources: I. Pathogenic Action of Culture Filtrates. T. Smith and R. B. Little, Princeton, N. J.—p. 123.
Id.: II. Mutations and Their Immunological Significance. T. Smith and G. Bryant, Princeton, N. J.—p. 133.
Id.: III. Normal and Serologically Induced Resistance to B. Coli and Its Mutant. T. Smith, Princeton, N. J.—p. 141.
Id.: IV. Biochemical Study of Capsular Substance. D. E. Smith, Princeton, N. J.—p. 155.
Surface Composition of Tubercle Bacillus and Other Acid-Fast Bacteria. S. Mudd and E. B. H. Mudd, Philadelphia.—p. 167.
Mechanism of Serum Sensitization of Acid-Fast Bacteria. S. Mudd and E. B. H. Mudd, Philadelphia.—p. 173.
Immunization Experiments with Lecithin. P. A. Levene, K. Landsteiner and J. van der Scheer, New York.—p. 197.

Direct Observation of Extracorporeal Thrombus Formation.—A method is described by Rowntree and Shionoya for the study in vivo of thrombus formation in blood circulating extracorporeally in an artificial loop. This method permits of control of many factors, and hence of intensive study of thrombus formation under many and varied conditions. It admits of separate study of the formation of white thrombi and of the deposition of fibrin, which may apparently be independent processes.

Thrombus Formation in Extracorporeal Loop.—Shionoya has observed that, in the normal animal, circulation in the extracorporeal loop usually ceases in from six to ten minutes, or at most, in very large and vigorous animals, in twenty-five minutes. Cessation of the circulation is due most frequently to obstruction of the venous cannula (sometimes of the arterial cannula) by a mass of white thrombi and secondary fibrin formation around it. The site of the clot is determined somewhat by the swiftness of the blood stream. In the collodion tube, red mural thrombi are obtainable as a rule. They are flat and present a wide base resting on tiny white thrombi. After the complete obstruction of the circulation, the blood in the apparatus clots very rapidly. When the obstruction occurs very quickly in either the arterial or the venous cannula, or when the blood stream is very slow, the clotting in the loop may occur before platelets are laid down in large numbers or before the formation of the white thrombi is evident. Mixed thrombi are found in the jugular vein, and have their inception in the white thrombi, in the cannula or from the injured intima. They extend in the direction of the blood flow.

Effects of Anticoagulants on Extracorporeal Thrombus Formation.—Effects of anticoagulants, heparin and herulin, on extracorporeal thrombosis were studied by Shionoya in thirty-three experiments by means of the extracorporeal vascular loop. In spite of adequate single doses of the anticoagulants, white thrombi are formed and obstruction to flow may follow in the course of time, but the formation of red thrombi is markedly retarded. The new method throws some light on the mechanics of thrombosis. The influences of foreign surfaces, of irregularities on the surface of the vessels, of whirlpools and of eddying motion of the blood current and of slowing and of stagnation with consequent prolonged contact with foreign surfaces are demonstrated, and these are analyzed in respect to the laying down of platelets and leukocytes. The structure of white thrombi formed after anticoagulant injection is almost identical with that described by Welch. In one respect, however, the present results appear to differ from his: the formation of fibrin is postponed and retarded, and hence the collections of platelets are deposited in greater amount.

Effect of Diet on Remaining Kidney.—The effects of the ingestion of diets containing different concentrations of protein on the remaining kidney in adult white rats after a unilateral nephrectomy has been studied by Moise and Smith. In the animals on the high protein diet (85 per cent casein), actual glomerular and tubular lesions were observed in the kidneys of animals maintained for ninety, 120 and 150 days after nephrectomy. In the animals on the standard ration, 18 per cent casein, no significant renal lesions were observed within the experimental period. Spontaneous focal lesions in the kidneys of rats maintained on Sherman's diets A and B were inconspicuous at the age of 350 days but became progressively more frequent and were commonly observed after 500 days. The animals on the high protein and standard rations were all under 350 days old at the completion of the experiment. It is suggested that the age factor is of importance in that young animals may have greater powers of adaptation in withstanding the injurious effects of high protein rations.

Immunity Response and Vaccination.—The results reported by Neill and Gaspari present an extreme example of the importance of the immunity response of the individual as a factor always concerned in the effectiveness of vaccination.

New York Lying-In Hospital Bulletin, New York

13: 115-177 (July) 1927

Prenatal Care. A. B. Davis, New York.—p. 115.
*Ruptured Uterus. A. B. Davis, New York.—p. 125.
Method of Caring for Premature and Underweight Babies at Lying-In Hospital, New York. L. J. Napier, New York.—p. 132.
*Toxemia of Pregnancy: 879 Cases with Convulsions. A. B. Davis and J. A. Harrar, New York.—p. 135.
Diagnosis of Engagement in Vertex Presentations. M. Rosensohn, New York.—p. 142.
Cesarean Section Under Local Anesthesia in Two Cardiopaths. W. H. Hawkins, New York.—p. 144.
*Congenital Anomalies of Gastro-Intestinal Tract. J. R. Losee, New York.—p. 148.
*Gangrene of Cecum in New-Born Infant. L. A. Wing, New York.—p. 153.
Looking Forward to Motherhood. J. A. Harrar, New York.—p. 155.
Fetal and Neonatal Mortality. M. Rosensohn, New York.—p. 167.
Obstetric Mortality: Analysis of Cases at Lying-In Hospital in 1924. M. Rosensohn, New York.—p. 170.

Rupture of Uterus.—Of eighty-eight examples of complete rupture of the uterus reported by Davis, forty-seven mothers died and forty-one recovered. There were seventy-five stillbirths; thirteen children lived. In the eighteen cases of incomplete rupture, ten mothers died and eight survived; eleven children were stillborn, six lived, and no note is found in the case of one child. Included in the total of eighty-eight complete ruptures are twenty-four which occurred through former cesarean scars. Twenty-one of these mothers lived, three died and five children survived. Among the sixty-four cases of complete rupture, other than those through cesarean scars, forty-four were emergencies. Thirty-four of these mothers died and ten lived. Forty-two children were stillborn; two survived. Of the twenty regular applicants, ten mothers died and ten lived. Fourteen of the children were stillborn; six lived. In the eighteen cases of incomplete rupture, ten were emergencies. Five of these mothers lived; five died. Eight children were stillborn and one survived. Among the five regular applicants three mothers died and two lived. Two of the children were stillborn and three lived. In three cases it was not noted as to whether they were emergencies or regular applicants. Two of these mothers died and one lived. There was one unclassified stillbirth, one child who lived and one case which is not noted.

Toxemia of Pregnancy.—Davis and Harrar analyze 279 cases of toxemia of pregnancy of the convulsive type, commonly known as eclampsia, which occurred in a series of 152,248 confinements. Included, there are 414 cases with convulsions beginning before labor; seventy-four cases in which the time of onset was not definitely noted but the majority of which evidently began ante partum; 118 cases in which convulsions began during labor; 234 cases in which convulsions began during the puerperium; twenty-three cases in which the patients died undelivered shortly after being admitted in a moribund condition, and sixteen in which the patients were discharged undelivered, pregnancy continuing. The unmistakable seasonal influence on the incidence of eclampsia is borne out in this study. The remarkable reduction in the incidence of toxemia and eclampsia, with greatly lowered maternal and infant mortality, is due to adequate prenatal care, with more conservative treatment and the free use of morphine during the attack.

Congenital Anomalies of Gastro-Intestinal Tract.—The baby in Losee's case apparently did well until the fifth day, when it began to regurgitate its food. It would retain feedings for as long as twenty-four hours and then practically all the nourishment that had been taken during that time would be regurgitated at once. This symptom gradually became pronounced and continued until death from inanition on the twenty-fifth day. At postmortem examination the stomach was observed to fill completely the anterior portion of the abdominal cavity. The capacity was 250 cc. of fluid and the pylorus was open. The musculature at the pylorus was not hypertrophied. There was no occlusion of the duodenum or anywhere in the intestinal tract. This condition was apparently caused by spasm.

Gangrene of Cecum in New-Born.—An exploratory laparotomy was done by Wing under ether anesthesia when the infant was 36 hours old. A right rectus incision was made; when the peritoneal cavity was opened, a large amount of free gas escaped, and a small amount of meconium was observed. The meconium was found to be coming from several minute perforations in the cecum, and the whole of the caput coli was found to be in a condition of early gangrene. The lower portion of the ileum was moderately distended and was filled with meconium. Further exploration revealed three peritoneal bands which passed obliquely across the cecum in its upper portion, binding it down firmly to the posterior abdominal wall. When these bands were divided, the cecum could be lifted up in a normal manner. Each band was about 3 mm. wide and 3 cm. long, and they lay together like a small bundle. No further anomalies were observed. The cecum was brought into the wound and secured there with several fine sutures, and the abdominal wound closed except for a drainage opening in the lower angle. For twenty-four hours the vomiting subsided and the baby seemed improved. After this period, however, the vomiting recurred, an actively spreading peritonitis developed, and the baby died on the fourth postoperative day.

Public Health Reports, Washington, D. C.

42: 1841-1892 (July 15) 1927

Experimental Studies of Water Purification: III. B. Coli Data. H. W. Streeter.—p. 1841.

42: 1893-1938 (July 22) 1927

Anopheles Atropos Dyar and Knab. T. H. D. Griffitts.—p. 1903.

42: 1939-1996 (July 29) 1927

*Illness Rate Among Males and Females: Hagerstown Morbidity Studies No. VI. E. Sydenstricker, Washington, D. C.—p. 1939.

Illness Rate Among Males and Females.—The general observation is made by Sydenstricker that the ratios of the incidence or the prevalence of sickness in one sex to that in the other is determined to a considerable extent by environmental as well as by physiologic factors.

Society Exper. Biol. & Med. Proc., New York

24: 807-998 (June) 1927

*Anaphylactic Shock Produced by Soluble Specific Substance Largely Carbohydrate in Nature. J. Tomcsik, Peking.—p. 812.
*Alleged Ephedrine Action of Two California Species of Ephedra. B. E. Read and C. T. Feng, Peking.—p. 819.
Blood of Animals in Hematoporphyrin Shock. H. Smetana, Peking.—p. 821.
*Kala-Azar Transmission Experiments with Chinese Sandflies (Phlebotomus). C. W. Young and M. Hertig, Peking.—p. 823.
*Conditions Affecting Emptying Time of Human Gallbladder. E. A. Boyden and C. L. Birch, Chicago.—p. 827.
Importance of Carbonate Ion in Physiologic Activity. A. B. Hastings and H. B. Van Dyke, Chicago.—p. 831.
*Susceptibility of Gastro-Intestinal Tract to Irritating Action of Salmonella Group of Food-Poisoning Bacteria. L. Arnold and C. Singer, Chicago.—p. 833.
*B. Melitensis and B. Abortus Agglutinins in Dispensary Patients. L. Arnold and W. E. Miller, Chicago.—p. 836.
*Blood Sugar Changes in Avian Polyneuritis. H. E. Redenbaugh, Chicago.—p. 842.
*Effect of Emotion on Basal Metabolism. H. L. Segal, H. F. Binswanger and S. Strouse, Chicago.—p. 845.
Qualitative Indicator for Testis Hormone. C. R. Moore, Chicago.—p. 847.
Simple Experimental Anemia and Liver Extracts. G. H. Whipple and F. S. Robscheit-Robbins, New York.—p. 860.
Influence of Pituitrin on Diuresis Variously Induced. F. P. Knowlton, A. N. Curtis and A. C. Silverman, New York.—p. 865.
Cardiac Output as Influenced by Ephedrine, Homocamfin, Quinidine, Quinine, Chloral and Chloroform. C. Reynolds and S. N. Blackberg, New Orleans.—p. 870.
Effects Produced in Rabbit by Feeding Cultures of Monilia Psilosis. D. C. Browne, New Orleans.—p. 873.
*Scarlatinal Nephritis Experimentally Induced in Dog. C. W. Duval and R. J. Hibbard, New Orleans.—p. 876.
Bacteriemia of Experimental Streptococcus Endocarditis. R. A. Kinsella and C. M. Hayes, St. Louis.—p. 887.
Development of Lymphocytes. M. T. Burrows, St. Louis.—p. 899.
Prenatal Growth of Human Thymus. R. E. Scammon, Minneapolis.—p. 906.

Bacteriophages in Bacterial Cultures. E. T. Dewey and R. G. Green, Minneapolis.—p. 911.
Effect of Unilateral Nephrectomy upon Number of Renal Corpuscles in Young Albino Rats. M. A. Shiels, Minneapolis.—p. 916.
Individual Differences of Human Blood. K. Landsteiner and P. Levine, New York.—p. 941.
"Salt Ophthalmia": III. E. V. McCollum, N. Simmonds and J. E. Becker, Baltimore.—p. 952.
Vitamin Studies: XV: Assimilation of Vitamins A and D in Presence of Mineral Oil. R. A. Dutcher, J. O. Ely and H. E. Honeywell, —p. 953.
*Microbic Dissociation: II. Tubercle Bacillus. S. A. Petroff, Trudeau, N. Y.—p. 956.
Correlation of Weight to Counting Method in Determining Number of Tubercle Bacilli. S. A. Petroff and W. Steenken, Jr., Trudeau, N. Y. —p. 958.
Influence of Ultraviolet Irradiation of Menotoxin and Pernicious Anemia Toxin. D. I. Macht, Baltimore.—p. 966.
*Growth-Promoting Value of Cod Liver Oil Irradiated by Sunlight and Mercury Vapor Lamp. A. L. Daniels and L. M. Brooks, Iowa City. —p. 971.
*Influence of Feeding Mixture on Antirachitic Potency of Cod Liver Oil Concentrate. A. L. Daniels and L. M. Brooks, Iowa City.—p. 972.
Effect of White Blood Cells in Rabbit by Ligation of Common Bile Duct. R. B. Holt, Nashville, Tenn.—p. 974.
Temperature Effects on Liver as Result of Lowering Intragastric Temperature with Ice Water. R. W. Mendelson, New Orleans.—p. 977.

Carbohydrate Causes Anaphylactic Shock.—It is shown by Tomcsik that in passively sensitized guinea-pigs anaphylactic shock is produced by very high dilutions of a substance that is largely carbohydrate in nature.

Ephedrine Action of California Ephedra.—Read and Feng failed to find any ephedrine in samples of *E. californica*, Wats, nor was there anything more than possibly an exceedingly small trace in *E. nevadensis*, Wats. Both species gave no rise in blood pressure, as did the preparations from Peking ephedra.

Kala-Azar Transmission Experiments.—Although sandflies infected with Leishmania may produce infections in hamsters when inoculated intraperitoneally, all efforts made by Young and Hertig to transmit the infection to hamsters by their bites have failed.

Emptying Time of Human Gallbladder.—Boyden and Birch assert that the mechanical passage of food through the intestinal tract is not a factor in the emptying of the gallbladder.

Susceptibility of Gastro-Intestinal Tract to Irritants.—Experiments made by Arnold and Singer show that there is a toxic substance present in *B. enteritidis* infected meat that acts as a gastric irritant and causes a diminution in the secretion of acid. This substance is heat stable and the toxicity is increased by heating. This is accompanied by an inhibition of the normal bactericidal mechanism of the intestinal tract.

Agglutination Response to B. Melitensis and B. Abortus.—Arnold and Miller found that 7 per cent of the average dispensary population have a specific response to *B. melitensis* and *B. abortus*.

Blood Sugar Changes in Avian Polyneuritis.—In Redenbaugh's experiments, polyneuritic pigeons showed an unmistakable hyperglycemia. The average blood sugar of the polyneuritic pigeon was almost double that of the normal.

Effect of Emotion on Basal Metabolism.—Experiments done by Segal et al. show very definitely that the average surgical case and the iodized toxic goiter show no preoperative rise in basal metabolism and that persons with toxic goiter not treated with iodine may have a dangerous rise.

Experimental Scarlatinal Nephritis.—The various types of glomerular and also the acute interstitial nephritis of human scarlet fever have been produced by Duval and Hibbard in the dog with the culture and with the pure toxic principle of *Streptococcus scarlatinae*. The experimentally induced acute nephritic lesions are of two forms, glomerular and interstitial, and these are alike in kind and variety to the acute scarlatinal nephritis of man.

Microbic Dissociation: Tubercle Bacillus.—Two distinct acid-fast organisms were isolated by Petroff from the sputum of a patient suffering from pulmonary tuberculosis. One grows homogeneously on fluid mediums, while the growth of the other on the same medium has the ordinary surface growth and appearance considered characteristic of acid-fast organisms.

Growth Promoting Value of Irradiated Cod Liver Oil.—Daniels and Brooks cite results that are in accord with those of previous workers who have shown that the irradiation of cod liver oil does not increase its antirachitic potency.

Cod Liver Oil Concentrate.—It would seem from the work of Daniels and Brooks that the most effective method of administering a cod liver oil concentrate is to dissolve it in oil.

South Carolina Med. Assoc. Journal, Greenville

23: 409-432 (July) 1927

Significance of Heart Murmurs. R. Wilson, Charleston.—p. 412.
Malaria Treatment of General Paralysis. C. F. Williams, Columbia.—p. 415.

U. S. Naval Medical Bulletin, Washington, D. C.

25: 505-782 (July) 1927

Avoidable Drowning. R. B. Miller.—p. 505.
Flies and Their Eradication. E. C. Carr.—p. 528.
Activities of U. S. Naval Medical Supply Depot. D. C. Cather.—p. 542.
Retinitis Pigmentosa: Case. C. B. Camerer.—p. 562.
*Premature Contractions of Heart. E. C. White.—p. 567.
Roentgen-Ray Examination in Suspected Chronic Appendicitis. P. P. Maher.—p. 573.
Comparison of Kahn and Kolmer Reactions. P. Richmond, Jr.—p. 585.
Origin of Disability. L. W. Johnson.—p. 588.
Department of Sanitation, Marine Barracks, Quantico, Va. W. M. Garton.—p. 593.
Cholecystography: Cases. G. H. Larson.—p. 597.
Thrombo-Angiitis Obliterans: Cases. R. A. Schneiders.—p. 605.
Debt of Surgical Diagnosis to Roentgen Ray. G. F. Cottle.—p. 614.
*Treatment of Chancroids and Other Lesions with Ammoniacal Silver Nitrate and Formalin. P. G. White and J. Q. Owsley.—p. 619.
*Gonococcus Infection Treated with Mercurochrome-220 Soluble Together with Sugar and Foreign Protein. L. H. Williams and W. D. Small.—p. 621.
Treatment of Lethargic Encephalitis. H. S. Hulbert.—p. 624.
Multiple Unerupted and Impacted Cuspid and Bicuspid Teeth: Case. M. W. Mangold.—p. 625.
Mixed Venereal Infections: Cases. G. F. Cooper.—p. 626.
Caisson Disease During Helmet Diving: Case. W. M. Anderson.—p. 628.
Arteriovenous Aneurysm of Common Carotid Artery and Internal Jugular Vein: Case. F. X. Koltes.—p. 630.
Creeping Eruption: Case. H. L. Shinn.—p. 632.
Death by Lightning: Case. J. D. Benjamin.—p. 634.
Device for Transferring Patients from Ships. T. Schofield.—p. 635.
Economical and Practical Utensil Sterilizer. C. Peek.—p. 637.

Premature Contractions of Heart.—Of 100 cases with premature contractions reviewed by White, 45 per cent were in cases with definite heart disease and 55 per cent in cases not presenting heart disease. Of the 100 cases, 30 per cent showed auricular premature contractions only, 51 per cent ventricular, 8 per cent nodal, and 11 per cent multiple foci. Of the 30 per cent auricular, twenty-four, or 80 per cent, were not associated with cardiac disease, while in the other six, or 20 per cent, the pathologic changes were not of a serious nature. Of the 51 per cent ventricular, twenty-one, or 41 per cent, were not associated with cardiac disease, while thirty, or 59 per cent, were associated with disease of more or less serious nature. Of the 8 per cent nodal, none were associated with cardiac disease. Of the 11 per cent multiple foci, nine, or 82 per cent, were associated with cardiac disease.

Treatment of Chancroid.—Twenty-five cases of chancroid were treated by White and Owsley at the Norfolk Naval Hospital with silver nitrate in liquor formaldehydi. The average length of time required for complete healing was from ten to fifteen days, as against from one month to three months under other methods of treatment. The solutions used were a saturated solution of silver nitrate crystals in 28 per cent ammonia, and 25 per cent solution of liquor formaldehydi, and pure oil of eugenol, each solution being applied in the order mentioned.

Use of Mercurochrome in Gonococcus Infections.—The results obtained by Williams and Small tend to show that this method of treatment is of considerable value in shortening the course of the disease, decreasing sick days, preventing complications, and alleviating the crippling effects of these complications when they do occur. One of the most striking points observed in this series of cases was the early and complete subsidence of distressing subjective symptoms following administration of the mercurochrome-220 soluble and milk.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Biochemical Journal, London

21: 457-764, 1927

Urea Content of Capillary and Venous Blood. E. Svensgaard.—p. 522.
Effect of Halogen Salts on Peptic Digestion. W. M. Clifford.—p. 544.
Carbohydrate Metabolism: III. Influence of Dihydroxyacetone on Respiratory Metabolism and on Inorganic Phosphate of Blood. C. G. Lambie and F. A. Redhead.—p. 549.
Purification and Properties of Insulin. F. Dickens, E. C. Dodds, W. Lawson and N. F. Maclagan.—p. 560.
Sulphur Metabolism. E. H. Callow and T. S. Hele.—p. 606.
Id.: H. I. Coombs and T. S. Hele.—p. 611.
Id.: VII. Effect of Fluorobenzene on Sulphur Metabolism. H. I. Coombs.—p. 623.
Reduction of Hematin and Methemoglobin. R. Hill and H. F. Holden.—p. 625.
Physiologic Rôle of Vitamin B: III. Vitamin B Deficiency. S. K. Kon and J. C. Drummond.—p. 632.
Id.: IV. Relation of Certain Dietary Factors in Yeast to Growth of Rats on Diets Rich in Proteins. A. Hassan and J. C. Drummond.—p. 653.
Possible Significance of Hexosephosphoric Esters in Ossification: VII. Bone Phosphatase. M. Martland and R. Robison.—p. 665.
Antiscorbutic Fraction of Lemon Juice: V. S. S. Zilva.—p. 689.
Composite Nature of Water-Soluble B Vitamin. H. Chick and M. H. Roscoe.—p. 698.
Effect of Desiccation on Nutritive Properties of Egg White. M. A. Boas.—p. 712.
Synthesis of Antineuritis Factor (Torulin) by Yeast. F. Hawking. p. 728.
Ovomucoid. J. Needham.—p. 733.
Succinic Acid in Muscle: II. D. M. Needham.—p. 739.
*Nitroprusside Reaction in Normal Tissues and Tumors. E. L. Kennaway and I. Hieger.—p. 751.
*Renal Threshold for Glucose. R. L. Mackay.—p. 760.

Nitroprusside Reaction in Normal Tissues and Tumors.—Analyses made by Kennaway and Hieger of normal tissues and of tumors in man and in the fowl show that tumors are not distinguished by any deficiency in glutathione.

Renal Threshold for Dextrose.—An investigation was carried out by Mackay with the object of determining the relationship between postanesthetic glycosuria and the blood sugar changes due to the anesthetic. The explanation of the results obtained in terms of the doctrine of the renal threshold for sugar at about 0.18 per cent proving unsatisfactory, it is suggested that this theory requires restatement, if not abandonment.

British Journal of Actinotherapy, London

2: 1-20 (April) 1927

*Ultraviolet Light in Prevention of General Paralysis. K. Huldschinsky.—p. 4.
Evolution of Man's Knowledge of Light. R. C. Macfie.—p. 6. C'td.

Prevention of General Paralysis by Ultraviolet Rays.—Huldschinsky suggests that ultraviolet rays may prevent the development of general paralysis of the insane.

British Medical Journal, London

2: 87-122 (July 16) 1927

Richard Bright: Man and Physician. W. S. Thayer.—p. 87.
*Influenza: 1889 to 1927: Salicin Treatment. E. B. Turner.—p. 93.
Pulmonary Fibrosis in Children. H. H. C. Gregory.—p. 96.
Polycythemia Hypertonica: Is Polycythemia Favorable Sign in High Blood Pressure? F. P. Weber.—p. 98.
Death by Electrocution. E. E. Jenkins and W. L. Cowardin.—p. 98.
*Rupture of Heart. C. W. Crawshaw.—p. 99.
Extensive Adhesion of Tongue. H. H. Khan.—p. 99.
Acute Nephritis Disappearing After Scarlet Fever. H. W. Ward.—p. 100.
Pregnancy and Glycosuria. T. A. Kean.—p. 100.

Salicin in Influenza.—Turner asserts that salicin not only cuts short the duration of the disease but also abolishes the numerous sequelae that were so marked a feature in all the epidemics. The essentials of the treatment are: first of all, to give the salicin as soon as there is a definite rise of temperature; to keep the patient warm in bed, on light simple food; to give 20 grains (1.3 Gm.) of salicin every hour for the first twelve hours, then 20 grains every two hours for the next twelve hours. For young persons the dose must be reduced. One grain (0.065 Gm.) for each year of the patient's age, with 1 grain extra "for the pot," is effectual. After the age of 18, the full 20 grains should be given.

Rupture of Heart.—Crawshaw relates the case of a man, aged 72, who was found dead. The cause of death was a rupture of the anterior wall of the left ventricle half an inch (1.25 cm.) in length. The tissue immediately surrounding the rupture was very friable and of a slate color. The left coronary artery was calcified and blocked by an old clot. The aorta was normal. The gallbladder contained about a dozen stones. The right kidney was hypertrophied and had a small cyst on its anterior surface. The left testis was fibrocystic and almost the size of a tangerine orange; the right testis was undescended. Both lungs were adherent, by old adhesions, at their apexes. The right foot was in an extreme degree of talipes equinovarus.

Ceylon Journal of Science, Colombo

1: 277-455 (May 16) 1927

*Parasitology of Plague: II. L. F. Hirst.—p. 277.

Parasitology of Plague.—The study made by Hirst on plague deals with the geographic distribution of rat fleas; the flea species factor; regional studies in the parasitology of plague occurring in Europe, Australia and the Far East, Colombo, British India and Burmah; the relative rôle of various species of rat flea in the spread of plague in nature; the species of flea in relation to other factors governing the spread of plague; parasitology, and plague prevention.

Edinburgh Medical Journal

34: 385-444 (July) 1927

*Action of Urinary Antiseptics. R. Stockman.—p. 396.
*Etiology of Pellagra. W. Susman.—p. 419.
Mydriasis and Cycloplegia as Result of Herpes Ophthalmicus. L. M. Ligert-Wood.—p. 423.
Sarcoma of Urachus. D. M. Greig.—p. 425.

Action of Urinary Antiseptics.—Stockman defines the action and value of the most commonly used urinary antiseptics and pleads for their more accurate application in individual cases. A reliable and efficient bacterial drug is especially needed for treating children, and to avoid the troublesome and objectionable use of instruments in adults.

Etiology of Pellagra.—In cultures from four cases of pellagra, Susman has obtained in cultures an anaerobic bacillus that stained readily with aniline dyes, giving a coccal or diplococcal appearance, but in Loeffler's methylene blue preparations a bacillary form was evident, with deeply staining polar structures which occasionally caused bulging. The bacillus is gram fast but not to any degree acid fast. The organism was propagated through four subcultures over about three months. Agglutination reactions with dilutions up to 1:640 gave positive results on two different occasions.

Glasgow Medical Journal

108: 1-64 (July) 1927

Toxemias of Pregnancy. J. N. Cruickshank.—p. 1.
*Albuminuria and Eclampsia. J. Hewitt.—p. 12.
Pulmonary Tuberculosis in Eastern District of Glasgow. J. A. Wilson.—p. 26.
*Cancer of Stomach of Prolonged Duration. T. K. Monro and A. Young.—p. 41.

Albuminuria and Eclampsia.—In approximately 20 per cent of patients with eclampsia, Hewitt found that they could not recall the happenings of the days immediately preceding the onset of the fits. This state he terms preeclamptic amnesia. During this period, however, no one detected any mental impairment, and the patients could and did execute reasoned action. This obliteration of the memory is permanent; it may concern events that took place months before the eclamptic attack; it is independent of the number of fits, of the degree of coma, of the blood pressure, and of the amount of albumin in the urine.

Cancer of Stomach of Long Duration.—Symptoms pointing to cancer of the stomach were manifested by Monro and Young's patient in July, 1917. In January, 1918, a laparotomy was performed and a widespread, disseminated, abdominal carcinoma was disclosed. The primary site evidently was the lesser curvature of the stomach, but now the whole pylorus

and a large part of the greater curvature were involved. The abdomen was closed. In June, 1920, the patient looked well and felt well. He died in April, 1922, more than four years after the operation. An autopsy was not obtained.

Journal of Pathology and Bacteriology, Edinburgh

30: 513-575 (July) 1927

Interference Phenomena in Action of Chemotherapeutic Agents in Trypanosome Infections. C. H. Browning and R. Gulbransen.—p. 513.
*Titration of Scarlet Fever Antitoxin in Rabbits. H. J. Parish and C. C. Okell.—p. 521.
*Osteoclastoma (Myeloid Sarcoma) of Human Female Breast. H. J. B. Fry.—p. 529.
Statistical Study of Relapse in Enteric Fever and Erysipelas. M. Young. —p. 537.
New Design of Porcelain Filter. C. E. Jenkins.—p. 555.
Diphtheria Bacilli in Bile. J. McCunn and A. M. L. Greaves.—p. 557.

Titration of Scarlet Fever Antitoxin.—By means of a test involving the protection of rabbits against the septicemia produced by the intravenous injection of the scarlet fever streptococcus, it has been found possible by Parish and Okell to distinguish efficient therapeutic serums from inefficient. The test has been used on a practical basis as a method of titrating antitoxin. Evidence is produced which strongly suggests that the antibody measured in the test is scarlet fever antitoxin and so far it has been found to run parallel with the usual methods of titrating antitoxin in human subjects.

Osteoclastoma of Female Breast.—A "teratoid" mixed tumor of the breast is described by Fry in which the predominant feature was the presence of multinucleated giant cells of "myeloid" type. These cells seemed to be "foreign body" giant cells of the nature of osteoclasts. The cartilaginous and osteoid tissue appeared to be derived by metaplasia from the fibrous tissue of a fibro-adenoma to which the sarcomatous tissue and giant cells are regarded as a tissue reaction.

Kenya and East African Med. Jour., Nairobi, E.Africa

4: 67-100 (June) 1927

Pica. J. W. Foster.—p. 68.
Response of Pulse to Exercise. M. Mackinnon.—p. 77.
*Nutritional Condition of East African Native. J. L. Gilks and J. B. Orr.—p. 85.
Rand Scurvy in Nandi Native at Nairobi Goal. J. A. Carman.—p. 90.
Disorders of Digestive System in Malaria. S. D. Karve.—p. 95.
Chest Disease Without Symptoms. W. Chand.—p. 99.

Nutrition of East African Native.—Gilks and Orr state that the African native is prone to infectious disease and is too frequently an individual of poor physique. The infantile death rate, where it has been worked out in purely native areas, is somewhere between 400 and 500 per thousand. Granted that the native babies are given artificial food at a very early age in the shape of gruel or chewed-up bananas, and that this may have a great influence on the production of a high death rate, yet may there not be a reason for the mother saying that "milk is not a food"? The real meaning may be that the milk produced by the mother is not of a quality sufficient to cause healthy growth in her offspring. The Kavirondo add cow's urine to their milk before consuming it.

Lancet, London

2: 103-156 (July 16) 1927

Diet and Dietists. T. Horder.—p. 103.
Poor-Law Hospital: Relation to General Practice. H. Nockolds.—p. 107.
*Incidence of Intrathoracic Tumors in Manchester. J. B. Duguid.—p. 111.
Poor-Law Infirmary from Inside. F. J. O'Donnell.—p. 117.
Gummatous Adenitis in Congenital Syphilis: Case. J. H. Sequeira and J. T. Ingram.—p. 118.
*Foreign Body Removed After Ten Years: Two Cases. E. H. R. Altounyan.—p. 119.
Total and Differential Cell Counts in Cerebrospinal Fluid. C. E. Newman.—p. 119.

Intrathoracic Tumors; Incidence. — One hundred and seventy-five cases have been discovered by Duguid among 10,780 necropsies. In the hospital wards, there occurred 148 cases of tumor, among 16,394 cases in six years, from 1920 to 1925, inclusive. Of the 175 infirmary cases, 151 occurred in males; 141 cases occurred between the ages 30 and 60. The right lung was involved in seventy-eight cases, the left in sixty-seven; both lungs were involved in eighteen and neither lung was involved in twelve cases. Secondary growths were reported in ninety-three cases.

Foreign Bodies with Long Residence.—The foreign bodies removed by Altounyan were (1) a bullet in the lung and (2) a coin in the nose. They had been in situ for several weeks.

Tubercle, London

8: 453-500 (July) 1927

*Interrelation Between Laryngeal Complication and Pulmonary Tuberculosis. J. Gravesen and F. W. Godbey.—p. 453.
*Bovine Tubercle Bacillus in Immunization. S. L. Cummings.—p. 459.
After-Results of "Sanocrysin" Treatment. B. R. Clarke.—p. 465.

Interrelation Between Laryngeal and Pulmonary Tuberculosis.—Six hundred and forty-five cases of laryngeal tuberculosis are analyzed by Gravesen and Godbey. Out of the last 281 cases the pulmonary disease was in the third stage in 271 cases, in the second stage in seven cases, and in the first stage in only three cases. Smoking does not predispose to laryngeal tuberculosis. More patients were women than men. Improvement or healing of the laryngeal lesion occurs frequently, despite the continued presence of tubercle bacilli in the sputum. This fact supports the view that laryngeal tuberculosis is not of bronchogenic origin. Many cases of laryngeal tuberculosis commence without symptoms. It is therefore necessary to examine the larynx regularly in every case of pulmonary tuberculosis, so that suitable treatment may be commenced as early as possible. Thoracoplasty improves the prognosis of cases complicated with laryngeal tuberculosis relatively more than of cases not so complicated. This observation supports the view that the prognosis of laryngeal tuberculosis depends on the activity and extent of the accompanying pulmonary disease. Healing of the laryngeal lesion depends on the adoption of suitable treatment. The best results have been obtained by a combination of light and collapse treatments.

Bovine Tubercle Bacillus in Immunization.—Cummings states that, in the efforts toward protective immunization in mammalian tuberculosis, it is not type which matters but the "dose" and the degree of virulence of the strain employed.

Japan Medical World, Tokyo

7: 97-125 (April 15) 1927

Antigenicity of Lipoids of Guinea-Pig Organs. M. Matsuda.—p. 97.
Influence of Constituents of Thymus Gland Cells Parenterally Introduced into Living Organism on Its Thymus Gland and Other Organs. K. Wada.—p. 100.
*Effect of Soy Sauce on Blood Sugar and Phosphorus. A. A. Horvath and L. Shin-Hao.—p. 105.
Relation of Glycogen and Carcinoma of Cervix of Uterus. T. Oki. —p. 108.

Effect of Soy Sauce on Blood Sugar and Phosphorus.—According to Horvath and Shin-Hao, the results in men of the oral administration of soy sauce are variable; hence no definite conclusion concerning the effect of soy sauce on blood sugar and phosphorus can be drawn. In some of the cases, soy sauce seems to have an effect on blood sugar and blood phosphates.

Journal of Oriental Medicine, Dairen, S. Manchuria

7: 1-6 (July) 1927

*Biochemistry of Hair: I. Calcium Contents. K. Ikeuchi.—p. 1.
Superficial Tension of Blood in Internal Diseases, Especially in Pulmonary Tuberculosis. T. Yamaguchi.—p. 2.
Morphology of Changes in Nerve Endings Following on Injections Made to Produce Local Anesthesia. S. Mitsui.—p. 3.
*Tuberculosis of Bones and Joints. O. Teramoto.—p. 4.
Whooping Cough Pneumonia: V. Postmortem Notes. T. Hayakawa.—p. 5.
Experimental Pathology of Arteries. M. Imai.—p. 6.

Calcium Content of Hair.—Ikeuchi asserts that the calcium content of hair is in close relationship to the pigment content. In growing human hair the calcium content is between 0.026 and 0.074 per cent; in adults it varies between 0.032 and 0.157 per cent, being higher in women than in men. The percentage is lower in the aged and in white haired persons.

Tuberculosis of Bones and Joints.—Among 25,031 cases, Teramoto found 422 cases of tuberculous bones and joints: 300 in female and 122 in male patients. The vertebrae were involved in 181 of these cases, the hip in fifty-five, the knee in forty-nine and the ribs in sixty-six cases.

Arch. de Méd. des Enfants, Paris

30: 201-256 (April) 1927

Heredosyphilis and Endocrine Glands. L. Babonneix.—p. 201.
*Blindness Without Eye Signs in Children. L. Genet.—p. 215.
Use of Ultraviolet Rays in Tuberculosis. G. Schreiber et al.—p. 230.

Blindness Without Ophthalmoscopic Signs in Children.—The causal diagnosis of blindness without lesions of the eyegrounds in the infant and small child is extremely difficult. Genet believes that in these cases lethargic encephalitis in its attenuated forms should be considered. Two of the author's patients recovered; in others blindness was still present after eight months. In certain of the cases, treatment should be directed toward the lethargic encephalitis and methenamine should be used.

Encéphale, Paris

22: 421-508 (June) 1927

Muscular Tonus: Physiologic Meanings. L. Bard.—p. 421.
*Nervous and Trophic Disturbances from Barbital. H. Claude et al.—p. 439.
Mental Status of Persons Subject to Hallucination. H. Bouyer.—p. 444.
Constitutional Factors: Rôle in Behavior Disturbances. F. I. Wertheimer.—p. 457.

Nervous and Trophic Disturbances from Barbital.—To the classical syndrome of barbital intoxication described by André Tardieu in 1924, Claude, Lamache and Daussy add a new symptom, viz., polyneuritis. The case of a woman who had taken 15 Gm. of barbital and 5 Gm. of phenobarbital is reported in detail. The polyneuritis was characterized by pain in the extremities and modifications of the reflexes; there was a decided lessening of the Achilles reflex in the acute period. Plaques of dry gangrene on the right foot, without apparent modification in the circulatory system, were attributed to the polyneuritis.

Gynécologie et Obstétrique, Paris

15: 241-320 (April) 1927

Postclimacteric Hemorrhages. M. Muret.—p. 241.
Subserous Salpingectomy. E. Villard and R. Labry.—p. 259.
Conservation of Uterus in Treatment of Bilateral Adnexitis. L. Michon and R. Labry.—p. 266.
*Uterine Hemorrhages in Young Girls: Treatment by Blood Transfusion. L. Michon and E. Banssillon.—p. 279.
Genital Sterilization and Interruption of Pregnancy. A. Turenne.—p. 300.
*Conservative Surgery and Radiotherapy for Ovarian Cysts. J. L. Lapeyre.—p. 307.

Uterine Hemorrhages in Young Girls: Treatment by Blood Transfusion.—Excluding cases in which pregnancy, infection or new growth play a part, curettage is the method most frequently employed by Michon and Banssillon. They usually follow curettage with cauterization by means of a 50 per cent solution of zinc chloride. Uterine fixation may be added. Roentgenotherapy and radium therapy are valuable. Results from the use of sodium citrate, intravenously, were inconclusive. Transfusion of citrated blood gave excellent results. The authors used a glass syringe or the Jubé apparatus, injecting from 50 to 100 cc. of citrated blood.

Conservative Surgery and Radiotherapy for Ovarian Cysts.—Lapeyre feels that in the course of laparotomy for cyst of the ovary, the condition of the other ovary must be ascertained. In case of a bilateral lesion, hysterectomy with bilateral ovariectomy should be performed. In case of doubt as to a possible lesion of the second ovary, it is wise to sacrifice it. Conservative surgery should be used only when safeguarding of the ovarian function is of major importance. After ablation of an ovarian cyst, the remaining ovary should be watched for recurrence. Radiotherapy seems to have a bad effect on early lesions of the ovarian epithelium. An ovarian cyst irradiated by error may become vegetative and the other ovary may degenerate later; hence, it would seem advantageous to perform castration at once, an operation the more legitimate since the irradiated ovary has lost a great part of its normal power of secretion. In case of a fibroma developing later in a patient operated on for ovarian cyst, the irradiation may have a bad effect on this ovary, predisposed as it is to degeneration. Radiotherapy must yield to surgical exeresis.

Presse Médicale, Paris

35: 833-848 (July 2) 1927

*Temporarily Positive Bordet-Wassermann Reactions in Late Syphilis. A. Sézary et al.—p. 833.
*Technic of Insufflations in Course of Artificial Pneumothorax. J. Stiassnie.—p. 834.
Treatment of Tabes with Malaria. H. Schaeffer.—p. 835.

Temporarily Positive Bordet-Wassermann Reactions in Late Syphilis.—Positive Bordet-Wassermann reactions in old syphilitics were met with by Sézary, Pernet and Gallerand in forty-one of 1,000 cases, examined from three to six times a year. In general, the seroreaction of the patients, taken as a whole, was longer negative than positive. The positive reactions are produced either spontaneously, or after a complete series of arsenic or bismuth injections, before which the serum was normal. These fleeting positives are often observed in syphilitics suffering from an active visceral lesion in which the causal influence of syphilis must be considered. One fact proves that these temporarily positive reactions are connected with an unextinguished syphilis; thirty-four of the forty-one patients had received insufficient treatment, some none at all. The value of a negative Bordet-Wassermann test is quite relative. In two-thirds of the cases the authors were able, through treatment, to bring the seroreaction to normal.

Technic of Insufflations in Artificial Pneumothorax.—The rapid method of insufflation is regarded by Stiassnie as being useless. Rapid injection of the gas and withdrawal of part of it is not indicated, since the purpose of the insufflations is to give the lungs rest and this method induces an accordion movement. Pleural effusions occur less often and are less abundant with the slow method. Stiassnie takes, on the average, four minutes to inject 100 cc.

Riforma Medica, Naples

43: 649-672 (July 11) 1927

Arthritism and Tuberculosis. A. Ferrannini.—p. 649.
Stenosis of Urethra from Tubercle. D. Giordano.—p. 651.
Cholelithiasis and Gastralgia. L. Docimo.—p. 653.
*Estimation of Uric Acid. E. Pittarelli.—p. 655.
Appendicitis in Twins. A. Angeli.—p. 664.
*Alleged Specificity of Tryptophan Reaction. G. De Toni.—p. 668.

Estimation of Uric Acid.—A sensitive colorimetric test for estimation of purine compounds in the urine has been devised by Pittarelli. He dilutes the urine from 40 to 100 times with water and to 50 cc. of this dilution adds, successively, 5 or 6 drops of a 0.5 per cent solution of methyl-amino-cresol-sulphate ("metol") or of para-amidophenol. Then he adds 5 or 6 drops of a 1 per cent solution of sodium or potassium persulphate and the same number of drops of a normal solution of sodium or potassium hydroxide. The maximum intensity of color develops within from fifteen to twenty minutes. A 1:4,000 solution of uric acid serves as a standard. The uric acid may be separated from the other purine compounds by means of zinc sulphate in an alkaline solution. If the uric acid in the blood is to be determined, he removes the proteins by boiling after the addition of sodium chloride.

Alleged Specificity of Tryptophan Reaction.—De Toni concludes that the tryptophan reaction of the cerebrospinal fluid described by Aiello is not specific for tuberculous meningitis.

43: 673-696 (July 18) 1927

Fever from Cancer. A. Testi.—p. 673.
*Basal Metabolism in Oxaluria. E. Lombardi.—p. 676.
Excision of Gastric Ulcers. L. M. Moriconi.—p. 677.
Sulphur Treatment of Malignant Tumors. O. Cignozzi.—p. 682.
Osteosarcomas. E. Aievoli.—p. 686.
Relapse of Scarlet Fever. I. Di Pace.—p. 692.

Basal Metabolism in Oxaluria.—The excretion of oxalic acid is independent of the basal metabolism, according to Lombardi. The administration of a strain of colon bacillus, isolated by the author and Piccininni, always induced oxaluria.

Anales de la Fac. de Med. y Farm., Havana

1: 1-102 (Jan. 1) 1927

Latent Diabetes. P. Escudero.—p. 9.
*Renal Loge. E. Stincer.—p. 13.
Transperitoneal Segmental Cesarean Section. A. Sánchez de Bustamante.—p. 20.

Benign Metacarpal Tumor. R. Menocal.—p. 27.
Endothelioma of Skin. V. Pardo Castelló.—p. 31.
Surgery of Goiter. M. Costales Latatú.—p. 35.
*Hookworms in Dog. P. Kouri Esmeja.—p. 45.
Pulmonary Abscess in Children. N. Puente Duany.—p. 54.
*Treatment of Acute Gonorrheal Prostatitis. A. G. Casariego.—p. 66.

Study of Renal Capsule.—After a thorough study from both the anatomic and the surgical points of view, Stincer feels justified in concluding that: The renal loge does not exist as conceived by the classical authors; the classic renal loge does not have any other value or significance than that of a cellular perirenal sheath. The kidney is contained in a loge, or more properly a fossa, with osteomusculo-aponeurotic walls on one side, and fibroserovisceral walls on the other. A direct communication between the two renal fossae does not exist. This anatomic fact is well demonstrated clinically. The "weak point" of the renal fossa resides in its lumbar portion (spaces of Grinfeldt and of Petit), a fact which clinical observation corroborates. Intra-abdominal pressure is the principal though not the exclusive means of fixation of the kidney. Credit should be given to the rôle played by the colomesocolic fasciae, which are, nevertheless, subject to variation as a result of accidents during the developmental stage. Renal ptosis should be conceived as a result of a previously existing anatomic alteration of the renal fossa, without the existence of which the organ can become displaced only with very much difficulty.

Lesions Produced in Intestine of Dog by Ancylostoma.—The author has seen ancylostoma attached not only to the superficial layers of the mucosa, but, very frequently, with its cephalic pole deeply embedded in the submucosa. Hyperplasia of the Lieberkühn glands, noted by Chatton in amebiasis, is also observed in ancylostoma infestation. Hypertrophy of the intestinal mucosa is evident. The submucous hemorrhage is due to the trauma to the capillary vessels of this layer caused by the piercing action of the parasite in its endeavor to attain a well vascularized area in the intestinal wall. Degeneration and necrosis of the tissues contained in the buccal cavity of the parasite and of those of the surrounding area tend to demonstrate the production by the parasite of a histolytic toxin, excreted into the buccal cavity. The severe inflammatory reaction, as shown by the infiltration of polymorphonuclear leukocytes in the vicinity of the cephalic pole of the ancylostoma, is probably due to bacterial infection from the intestinal canal induced by the piercing action of the vermes.

Prostatotomy in Urinary Retention in Gonococcus Prostatitis.—Casariego describes a case of acute retention complicating gonococcus prostatitis that was promptly and permanently cured by perineal prostatotomy and drainage. The patient was able to pass urine spontaneously on the fourth day after the operation, and was discharged, cured, a few days later.

Anales Soc. Mex. de Oftalmología, etc., Mexico City

6: 97-120 (May) 1927

*Treatment of Eczematous Conjunctivitis and Keratitis. A. Torres Estrada.—p. 97.

Arsenicals and Mercurials in Eczematous Conjunctivitis and Keratitis.—Since 1920, Torres has been using successfully mercury and arsenic compounds in the treatment of eczematous conjunctivitis and keratitis in children. This method has not only brought about a considerable decrease in the number of such cases at the Foundling Home at Mexico City, but it has also altered the clinical course for the better. Tuberculosis is not the only contributory factor in the disease. While syphilis is rather frequent, its incidence is not large enough to explain the condition.

Folha Medica, Rio de Janeiro

8: 153-164 (July 1) 1927

*Insulin in Postoperative Vomiting. O. Clark.—p. 153.
Pathogenesis of Malarial Paroxysm. H. Póvoa.—p. 154.
Housing and Tuberculosis. J. P. Barbosa.—p. 157.

Insulin in Postoperative Vomiting.—Clark has used insulin successfully to control postoperative vomiting as well as persistent retching.

Revista Esp. de Obstet. y Ginecología, Madrid

12: 241-288 (June) 1927

*Differential Diagnosis of Extra-Uterine Pregnancy. E. Macías de Torres.—p. 241.
Treatment of Carcinoma of Uterus. C. R. Balta.—p. 249.

Differential Diagnosis of Extra-Uterine Pregnancy.—Only 20 per cent of patients with ectopic pregnancy, warns Macías, exhibit true amenorrhea in the early stages. They do not consider themselves pregnant, and thus the physician is often mislead. Even in rupture cases, in the second stage, the general practitioner is likely to make a diagnosis of appendicitis. In the third stage it is most liable to be mistaken for adnexitis or metrorrhagia. Macías describes several typical cases. In the first stage, diagnosis should be based on the presence of a juxta-uterine tumor and amenorrhea, especially if the mass continues to grow between two successive examinations. In the second stage, appendicitis may be ruled out by the location of the pain, the skin irritability, the character of the fever, the absence of leukocytosis and especially by the presence of uterine hemorrhage. Puncture of Douglas' culdesac and the sedimentation test also help. In the first and second stages, an emergency operation is indicated.

Rev. Ibero-Americana de Ciencias Méd., Madrid

2: 243-284 (June) 1927

Diagnosis of Pulmonary Tuberculosis. G. Triviño.—p. 243.
*Tannin in Nervous Disturbances. W. Borrachero.—p. 257.

Tannin in Nervous Diseases.—Tannic acid, either in syrup, capsules or iodized solution, has been found by Borrachero to be useful to correct certain nervous disturbances in chorea, hysteria and Parkinson's disease.

Revista de Med. y Cirugía de la Habana, Havana

32: 491-554 (July 25) 1927

*Basal Metabolism. A. J. Coro.—p. 491.
*Idem. O. Montoro.—p. 503.
Supernumerary Scalenus Bundle. C. Cabrera Calderín.—p. 528.

Basal Metabolism in Tropics.—Coro determined the basal metabolism rates in forty-five men and eighty women in Havana. The difference between his figures and those of Dubois for the United States are so unimportant that the latter might be accepted as standards for Cuba and other tropical countries.

Idem.—Montoro states that Coro's results, so contrary to those obtained by Ozorio de Almeida and Montoro, are due to his inexperience. All available data show that the basal metabolism rate of residents in the tropics is lower than that of people in colder climates. Experimental work done on rats seems to bear this out.

Siglo Médico, Madrid

80: 1-24 (July 2) 1927

*Splanchnovenous Blood Therapy. E. Escomel.—p. 1.
Auricular Function. G. R. Gonzalo.—p. 3.
Water-Borne Diseases. J. Conthe.—p. 4.

Splanchnovenous Blood Therapy. — Escomel's specific splanchnic venous therapy consists of injection of whole blood or serum from the veins of an animal's organ to combat the pathologic deficiencies of the same organ in man. The author asserts that arterial blood, after getting rid of its nutritive, excretive and neutralizing materials, returns through the veins loaded with the principles of internal secretions. Hence, this treatment with venous blood is actually more efficient than organotherapy. For this specific splanchnic blood therapy those animals closest to man should be preferred.

80: 49-72 (July 16) 1927

*Gland Tuberculosis. J. Luna y Gañán.—p. 49.
New Cataract Operation. D. Jiménez García.—p. 58.

Sodium Cacodylate in Tuberculous Lymphadenitis. — In Luna's four cases, a 2.0 per cent solution of sodium cacodylate, administered intravenously in increasing doses of from 1 to 6 cc., brought about remarkable improvement in the enlarged glands and the other symptoms. The treatment can be repeated after fifteen or twenty days.

Archiv f. exper. Pathologie u. Pharmakol., Leipzig

123: 129-258 (July) 1927

*Chamomile, Mint and Fennel in Inflammations. W. Arnold.—p. 129.
Lymph After Irradiations. W. F. Petersen and W. F. von Öttingen.—p. 160.
Diuresis from Merbaphen. K. I. Melville and R. L. Stehle.—p. 175.
*Epinephrine and Atropine in Encephalitis. R. Gantenberg.—p. 186.
*Plasma Volume After Water Intake. H. Marx and W. Mohr.—p. 205.
International Standardization of Digitalis. C. de Lind van Wyngaarden.—p. 215.
Metabolism of Heart. P. Junkersdorf and S. Hanisch.—p. 231.
Pharmacology of Parsley Group. A. A. Christomanos.—p. 252.

Chamomile, Mint and Fennel in Inflammations.—Arnold compared the action of a 5 per cent infusion of these drugs with that of warm water in experimental inflammations induced by mustard, artificial sunlight, tuberculin and in a drug rash. The chamomile tea and a 0.005 per cent emulsion of oil of chamomile in water had a decided mitigating influence, due to constriction of the capillaries. The oil of mint was less efficient, while the oil of fennel increased the inflammation.

Epinephrine and Atropine in Encephalitis.—The reversal of the action of epinephrine in certain cases of chronic encephalitis was confirmed by Gantenberg. The phenomenon was evident in the circulatory and glycoregulatory response. The gas metabolism after the injection of epinephrine changed, however, in the same way as in the control.

Plasma Volume After Water Intake.—As a control of their experiments based on the estimation of hemoglobin as an indication of dilution of blood, Marx and Mohr determined the plasma volume. Both methods gave corresponding results, which indicate that the drinking of water is followed by a considerable dilution of the blood. After one or one and one-half hours the water content of the blood (and the volume of the plasma) rose, but this was followed by another dilution of the blood. The hemoglobin concentration returned to the previous level in five or six hours. The blood curve was not exactly parallel with the diuresis. The method allows estimation of plasma volume with small (5 cc.) samples of blood.

Archiv für die gesamte Physiologie, Berlin

217: 151-298 (July 18) 1927

*Heart in Anoxybiosis. H. Bachmann.—p. 151.
*Humoral Transmission of Nervous Impulses. L. Asher and N. Scheinfinkel.—p. 184.
*Action of Iodine on Metamorphosis. B. Zawadovsky et al.—p. 198.
*Iso-Electric Points of Constituents of Muscle. A. Pischinger.—p. 205.
*Rigor Mortis in Irritated Muscle. H. J. Wolf.—p. 210.
Permeability of Muscle Membranes. H. Winterstein and E. Hirschberg.—p. 216.
Gastric Digestion and Starvation in Sharks. M. Dobreff.—p. 221.
All or Nothing Law in Nervous Centers. J. von Ledebur.—p. 235.
Exertion and Secretion of Pancreas. A. Ptschelina.—p. 250.
*Spleen as Reservoir of Erythrocytes. A. Scheunert and F. W. Krzywanek.—p. 261.
*Metabolism in Phlorhizin Diabetes. S. Hanisch and P. Junkersdorf.—p. 264.
Action of Direct Current on Microscopic Picture of Nerves. S. Katsura.—p. 279.
Sympathetic Innervation of Eye. W. Dieter.—p. 293.
Sympathetic Innervation and Rhythmic Movements of Arteries. J. Mosonyi.—p. 297.

Heart in Anoxybiosis.—By using all precautions, especially in regard to the perfusing fluid, Bachmann was able to keep a frog's heart beating for sixty-one hours without the presence of oxygen. The response of the heart to artificial stimuli was, however, considerably lowered. Addition of oxygen to the perfusing fluid was followed by complete and immediate restitution.

Humoral Transmission of Nervous Impulses.—The same changes in the frog's heart beat were induced by Asher and Scheinfinkel when using a small rubber ball as those obtained when they connected the heart with another stimulated heart (instead of the ball) the contents of which were used for perfusion of the test heart. They attribute the positive results reported by other investigators to the formation of nonspecific substances under the influence of circulatory disturbances, and conclude that the assumption of a humoral transmission of vagus effects is without basis.

Action of Iodine on Metamorphosis.—Zawadovsky, Titajev, Perelmutter and Raspopowa induced metamorphosis in axolotls with intraperitoneal injections of 0.01 mg. of thyroxin per 10 Gm. of body weight. Tyrosine, tryptophane—even with simultaneous injections of iodine, as well as diiodotrysine and diiodotryptophane induced only initial stages of metamorphosis in doses exceeding 30 mg.

Iso-Electric Points of Constituents of Muscle.—Pischinger determined colorimetrically the iso-electric points of three constituents of muscle. He used solutions containing a hundredth molar acetate buffer and a five hundredth molar solution of either methylene blue or crystal ponçeau.

Rigor Mortis in Irritated Muscle.—Wolf was able to prevent postmortem rigidity even in fatigued muscles by exposing them to an atmosphere or fluid saturated with oxygen. He regards this as confirmation of the theory that the rigor is due to accumulation of lactic acid.

Spleen as Reservoir of Erythrocytes.—Scheunert and Krzywanek did not find any difference in the erythrocyte volume before and after exertion for one year after splenectomy. Consequently, it seems that the spleen is the only organ which regulates the amount of circulating erythrocytes.

Metabolism in Phlorhizin Diabetes.—Hanisch and Junkersdorf injected phlorhizin into dogs overfed with proteins. This food prevented the hypoglycemia, fatty infiltration of the liver and excretion of ketone bodies, which are otherwise observed.

Arch. für klin. Chirurgie, Berlin

146: 1-300 (May 20) 1927

Influence of Vegetative Nervous System on Resorption from Abdominal Cavity. E. Stahnke.—p. 1.
Cicatricial Processes in Large Intestine. A. W. Fischer.—p. 19.
Prophylaxis of Tetanus. B. Mosbacher.—p. 41.
Treatment of Talipes Valgus. E. Schneider.—p. 64.
Retroperitoneal Carcinoma. E. Meyenberger.—p. 74.
Irritants; Their Action. C. B. Strauch.—p. 97.
Diseases of Intra-Articular Cartilages of Knee. F. Mandl.—p. 149.
Ligation of Pulmonary Vessels. S. A. Smirnow.—p. 215.
*Aseptic Emboli in Long Bones. E. Lobeck.—p. 222.
*Recurrence of Colic After Cholecystectomy. H. Hueck.—p. 255.
Etiology of Osteitis Tuberculosa Multiplex Cystoides. F. Schürer-Waldheim.—p. 267.
Origin of Solitary Cartilaginous Exostoses and Exostosis Bursata with Free Cartilaginous Bodies. K. Mészáros.—p. 291.

Aseptic Emboli in Long Bones.—In Lobeck's experiments on dogs, neither osteochondritis dissecans nor bone necrosis followed aseptic embolism of the arteries and precapillaries supplying the femur.

Recurrence of Colic After Cholecystectomy.—Neither the type of gallbladder disease, nor the age of the patient, nor the time of the operation, whether early or late, was found by Hueck to have any important influence on the recurrence of colic after cholecystectomy. Local irritation, as from a stone, or a purely nervous irritation in a distant part may provide the exciting cause, but predisposition appears to be essential. A certain means of prevention is not known.

Deutsche Zeitschrift für Chirurgie, Leipzig

202: 1-216 (April) 1927

*Polypi of Large Intestine. V. Schmieden and H. Westhues.—p. 1.
Appendicitis. G. Ricker.—p. 125.
Pathogenesis and Malignant Degeneration of Gastric and Duodenal Ulcers. V. Orator and F. Metzler.—p. 167.
Dead Spaces in Gastric and Intestinal Surgery. A. L. Soresi.—p. 193.
Sphincter Dilatation After Laparotomies. A. Herrmann.—p. 210.

Polypi of Large Intestine; Their Relation to Carcinoma.—Schmieden and Westhues recognize three groups: the benign, the relatively benign or relatively malignant, and the malignant. Benign polypi usually have long, narrow pedicles. Their epithelium scarcely differs from that of normal mucosa. In the second group, differentiation of the epithelium sets in very early and progresses slowly, extending to the gland ducts in their entirety, with some preference, however, for the neck segments and surface epithelium. They develop into large, villous, cauliflower growths. Their structure is organoid. In the third group, the differentiation and growth are limited to the neck segments of the gland and to the surface epithelium

and proceed rapidly. These polypi grow wildly and without tendency to organic structure. The characteristic precancerous change consists in the replacement of the long, narrow, dark, closely packed nuclei of the polypus cell by polymorphous, oval, vesicular nuclei. Ulcerous degeneration usually accompanies carcinomatous change. The most malignant polypi are almost always small, plump and broad-based. A polypus with a long pedicle does not recur if it is extirpated at its base. A dark surface color is a bad sign, particularly in a small polypus. For biopsy purposes the small polypi often give more reliable indications of the degree of malignancy than larger and older growths. Treatment should be radical; whether this will mean the extirpation of a single polyp merely or of the entire large intestine will depend on the individual case.

Frankfurter Zeitschrift für Pathologie, Munich

35: 165-373, 1927

*Birth Crisis in Blood Picture of New-Born. W. Büngeler and P. Schwartz.—p. 165.
*Lung Changes in Whooping Cough. F. Feyrter.—p. 213.
*Unusual Metastases of Sarcoma with Presence of Two Tumors. E. Hammann.—p. 256.
Dermoid of Fourth Ventricle. D. Görög.—p. 265.
Relation of Cerebrospinal Fluid of Corpse to Brain Swelling. K. Brandes.—p. 274.
Argentaffin Cells in Mucous Membrane of Appendix; Relation to So-Called Carcinoid. H. Sprafke.—p. 302.
Congenital Bronchiectasis (Honeycomb Lung). R. Hückel.—p. 320.
Effect of Hydrogen-Ion Concentration on Development and Involution of Stasis. C. Merk.—p. 343.
*Brain Hemorrhage in Leukemia. G. Rosenkranz.—p. 359.

Birth Crisis in Blood of New-Born.—Büngeler and Schwartz examined the blood of the umbilical cord of many new-born babies and found that the blood picture undergoes a definite change immediately after birth. This change they have designated the "birth crisis." It consists of an increase in the number of erythrocytes and leukocytes and a shifting of the Arneth count to the left. The picture varies with the length and the nature of the birth process. It is believed to be the result of birth traumas and the resulting hemorrhages, resorption processes and tissue changes. In all probability this crisis stands in some etiologic relationship to the anemias of infants.

Lung Changes in Whooping Cough.—The lungs from 225 cases of fatal whooping cough were examined by Feyrter. He believes that the lung becomes affected early in the course of the disease, and that the bronchial tree is involved permanently. He found endobronchitis, endobronchiolitis; peribronchitis and peribronchiolitis; bronchiolitis fibrinosa and obliterans, ectasias and stenoses. The peribronchitis, no doubt, explains the long duration of the pulmonary affections of whooping cough; the frequent exacerbations and the peculiar nature of the lung sounds. The author describes his findings in detail. In thirty-two cases evidences of tuberculosis were found.

Sarcomatosis with Unusual Metastases.—Hammann reports the case of a man, aged 41, who had what was believed to be a myositis nodosa. The whole body, except the lower leg, presented twenty or more small nodules, which, on microscopic examination, appeared to indicate an inflammatory process involving the muscles. The blood and spinal fluid Wassermann tests were negative. The patient died suddenly. At necropsy, a spindle cell sarcoma of the thyroid, with generalized sarcomatosis, was found. Metastases were found in all the voluntary muscles, in the heart, brain, lungs, kidneys, intestine and diaphragm. The right kidney was the seat of a hypernephroma.

Brain Hemorrhages in Leukemia.—Rosenkranz reviews the literature and reports two cases in which, at necropsy, many brain hemorrhages were found. He believes these hemorrhages to be of myeloic origin and directs attention to the fact that they may be the immediate cause of death in these cases and also of many symptoms manifested by these patients, such as headache, restlessness, vomiting and slight paralyses. Frequently, death supervenes soon after one or more of these symptoms is noted. On section of the brain in such cases, extensive hemorrhages have been found.

Klinische Wochenschrift, Berlin

6: 1361-1408 (July 16) 1927

Water Metabolism. R. Siebeck.—p. 1361.
Acid-Base Equilibrium and Stomach. L. Hermanns and J. M. Sakr.—p. 1367.
*Neurotropic and Somatotropic Spirochetes. I. L. Kritschewski.—p. 1370.
*Influence of Thallium Poisoning of Mother on Offspring. K. Ehrhardt.—p. 1374.
Mastic Reaction in Cerebrospinal Fluid. G. Emanuel and H. Rosenfeld.—p. 1375.
Puncture of Artery. G. Rosenow.—p. 1378.
Cisterna Puncture in Children. J. Bakucz.—p. 1379.
Infections with Bacillus Abortus. E. Kreuter.—p. 1380.
Ovarian Hormone. E. Laqueur et al.—p. 1382.
Idem. B. Zondek.—p. 1382.
Contractility of Gallbladder. H. Erbsen and E. Damm.—p. 1382.
Chemotherapy of Mouse Cancer. L. Karczag.—p. 1382.
Optic Neuritis in Lactation. L. Wander.—p. 1383.
Treatment of Cardiac Edema. A. Schott.—p. 1384.
Traumatic Necrosis. W. Eliasberg.—p. 1388.
Isolation of Leukocytes and Blood Platelets. G. Endres.—p. 1407.

Neurotropic and Somatotropic Spirochetes.—Kritschewski observed wide differences between the frequency of diseases of the brain in mice infected by various strains of recurrens spirochetes. He concludes from this that there might be similar neurotropic strains of *Spirochaeta pallida*.

Influence of Thallium Poisoning of Mother on Offspring.—Ehrhardt fed a mother rat large doses of thallium for four days, when the rat died. The young rats were then transferred to another lactating rat and fed with her milk, but showed all the typical effects of thallium poisoning.

Medizinische Klinik, Berlin

23: 1049-1088 (July 15) 1927

Renal Calculus and Nephritis. L. Casper.—p. 1049.
Typhoid Epidemic in Hanover. E. Steinitz.—p. 1050.
Idem. Jürgens.—p. 1053. C'cn.
*Treatment of Congenital Syphilis. E. Müller.—p. 1057.
Lymphatic Cysts of Mesentery. W. Hoffmeister.—p. 1059.
*Treatment of General Paralysis. A. Plehn.—p. 1061.
Pathogenesis of Mediastinal Emphysema. H. U. Ritschel.—p. 1062.
Gastritis, Duodenitis and Ulcers. G. E. Konjetzny and H. Puhl.—p 1063. C'cn.
Compression of Chest and Death from Aneurysm. C. Klieneberger.—p. 1069.
Renal Function Tests. F. Lebermann.—p. 1071. C'td.

Treatment of Congenital Syphilis.—Müller gives only one course of treatment to infants with congenital syphilis and reports favorable results so far. He uses large doses of neoarsphenamine (0.04 Gm. per kilogram of body weight intravenously) and of calomel (0.002 Gm. per kilogram intravenously), making twelve injections of each within twelve weeks.

Malaria Treatment of General Paralysis.—Good results were obtained by Plehn with estivo-autumnal malaria in patients who were not benefited by the tertian variety. The former infection is not so easily cured as the latter, but he does not rate the danger from it as being higher.

Monatsschrift für Geb. und Gynäkologie, Berlin

76: 165-240 (May) 1927

*Disturbances of Vision in Pregnancy. S. Fraymann.—p. 165.
Treatment of Contracted Pelvis. H. Kupferberg.—p. 176.
Mechanism of Development of Cell. L. Weill.—p. 184.
Transplantation of Uterus in Dogs. S. G. Bykow.—p. 186.
Importance of Mucous Membrane in Tubal Pathology. W. Lahm.—p. 192.
Influence of Maternal Syphilis on Child. A. Müller.—p. 216.
Training of Midwives. H. Walther.—p. 228.
Care of Mother and Child. D. Pulvermacher.—p. 230.

Toxic and Mechanical Causes of Disturbances of Vision During Pregnancy and Parturition.—Fraymann urges that more attention should be paid to the eyes of pregnant women. Amaurosis may be the first sign announcing a severe pregnancy toxicosis. He reports a case in which a primigravida became completely blind three days before delivery. Vision was recovered shortly after the birth. The patient was in a preeclamptic condition, and Fraymann ascribes the blindness to a toxic lesion of the central nuclei in the occipital portions of the brain. A case of homonymous hemianopia developing four days after normal delivery in a primipara is also described. Two and a half hours after the birth, the patient

had three eclamptic attacks. Before the birth, the urine is reported as having been turbid. On the day after the birth, it contained neither albumin, sugar nor casts. The hemianopia cleared up in a week. Neurologic examination suggested that the ocular symptoms were caused by pressure on the right optic tract, and Fraymann is inclined to assume asymmetrical hemorrhage into the pituitary, rather than true hypertrophy of the gland, as the cause. As regards the association with eclampsia, he mentions Hofbauer's hypophyseal theory of eclampsia.

Münchener medizinische Wochenschrift, Munich

74: 1123-1170 (July 8) 1927

*Dietotherapy of Diabetes. K. Petrén.—p. 1123.
Treatment of Superacidity. Schellong.—p. 1127.
*Parenteral Treatment with Alcohol. B. Spiethoff.—p. 1128.
Local Application of Vitamins in Dermatoses. H. Beck.—p. 1129.
*Relationship Between Appendix and Bauhin's Valve. W. Gross. —p. 1130.
Hemostats and Forceps. J. R. Thim.—p. 1134.
Monauricular Rubber Hose Stethoscope. B. Hildebrand.—p. 1134.
*Cooking and Food Value. A. Scheunert and E. Wagner.—p. 1134.
*Epidemiology of Typhoid. F. Wolter.—p. 1138.
A Physician's Thoughts on Medicine. A. Bier.—p. 1141. C'tn.
Diseases of Endocrine Glands. W. H. Veil.—p. 1147.
Russian Social Insurance. A. Dworetzky.—p. 1149. C'cn.

Dietotherapy of Diabetes.—Petrén discusses the rationale of his diet, consisting of large amounts (200-250 Gm.) of fat, 100-150 Gm. of 30 per cent cream and a large amount of vegetables. Asparagus, lettuce, cucumber and rhubarb may be eaten freely. Almost the same applies to other vegetables and fruits containing up to 6 per cent of carbohydrates. Cheese, bread, milk are prohibited. He has the impression that a diabetic patient can get along on less proteins than a healthy subject. For the latter, at least 0.22 Gm. per kilogram of body weight is necessary. He has given to diabetic patients sometimes as little as from 0.15 to 0.20 Gm. per kilogram. A positive nitrogen balance was obtained with from 2 to 3 Gm. of nitrogen in the urine. He attempts to bring the blood sugar down to 0.11 per cent, using insulin, if necessary. Even then, he uses as little of it as possible and discontinues it cautiously. Additions to the diet should also be made cautiously (not more than 10 Gm. of bread in two days).

Parenteral Treatment with Alcohol.—In inflammatory conditions with a tendency to breaking down of tissue, Spiethoff injects intramuscularly, twice a week, from 0.05 to 0.1 cc. of alcohol in a one to two or one to five dilution. The results were as good as from protein treatment. He mentions especially success in a patient with frequent pollutions.

Relationship Between Appendix and Bauhin's Valve.—An isolated contraction of the ileocolonic muscle was induced by Gross when irritating the appendix with a faradic current.

Cooking and Food Value.—Scheunert and Wagner fed young rats with the same food mixture in a raw, cooked or overcooked state. They found that the rat's increase in weight was greatest on the overcooked food. Their experiments differed from Friedberger's by the use of a mixture of foodstuffs (instead of restaurant food) and by the use of slightly older rats.

Epidemiology of Typhoid.—The recent epidemics of typhoid in Germany are explained by Wolter chiefly according to Pettenkofer's theory. Gases from the soil play a rôle.

Wiener klin. Wochenschrift, Vienna

40: 961-988 (July 28) 1927

*Immunization Against Diphtheria with Toxoids. K. Kundratitz.—p. 933.
Autovaccines in Colitis. K. von Knorr.—p. 935.
Splenomegaly of Gaucher Type. O. Weltmann and P. Deuticke.—p. 937.
Labor with Contracted Pelvis. L. Kraul.—p. 938.
*Ischialgia from Cancer Metastasis. F. Mandl.—p. 942.
Lesions of Semilunar Cartilages. F. Demmer.—p. 944. C'cn.
Goiter and Tuberculosis. I. Fischer.—p. 948.
*Diagnosis of Diseases of Pleura. J. Sorgo.—p. 949.
Treatment of Septic General Infection. W. Denk. Supplement.—pp. 1-12.

Immunization Against Diphtheria with Toxoids.—Toxoids should be used for immunization against diphtheria instead of the toxin-antitoxin mixtures, according to Kundratitz. They are innocuous and efficient.

Ischialgia from Metastasis of Cancer.—In these cases an epidural injection of a weak solution of procaine hydrochloride may free the patient from pain for weeks. In other cases Mandl advises liberating the sciatic nerve from the constricting masses.

Diagnosis of Diseases of Pleura.—Sorgo asserts that changes of the skin may be observed in every case of acute or chronic inflammation of the parietal pleura. The symmetrical skin folds are of different thickness, or on one or both sides they are tougher than normal, or it is more difficult to lift them from the underlying tissues.

Zeitschrift für klinische Medizin, Berlin

106: 1-214 (July 13) 1927

History of Angina Pectoris. H. Kohn.—p. 1.
Electrochemistry of Human Skin. W. Lueg.—p. 21.
Significance of Pulmonary Vessels. P. Neuda.—p. 28.
*Vasomotor Substances of Blood. N. Lichatschewa.—p. 46.
Sensory Cardio-Aortic Fibers. D. Danielopolu.—p. 54.
Diagnosis of Infarction of Myocardium. B. Jegorow.—p. 71.
Hypertension and Metabolism. J. Gelmann.—p. 95.
Protein Quotient in Nephritis. V. Kollert and K. Hartl.—p. 110.
*Gout. F. Gudzent and E. Holzmann.—p. 117.
Diabetes Insipidus. E. Bloch and O. Hilsnitz.—p. 129.
Exertion and Blood Picture. A. Egoroff et al.—p. 159.
Blood Changes After Swimming Races. N. Westenrijk.—p. 178.
Injectible Iron Preparation. H. Schreiber.—p. 183.
Pseudochylous Pleural Exudate. G. F. Lorenz.—p. 187.
Takata-Ara Reaction in Cerebrospinal Fluid. R. Nicole.—p. 192.
Indirect Test for Galvanic Irritability. D. Adlersberg and O. Porges. —p. 210.
Frequency of Bothriocephalus Anemia. G. Rosenow.—p. 212.

Vasomotor Substances of Blood.—Lichatschewa found indications of the presence of vasoconstricting and vasodilating substances in the blood. On standing, the amount of constricting substances increases. Fresh blood from cachectic patients constricts the artery, but if it is diluted vasodilatation prevails.

Gout.—The necropsy reports in seventy-seven cases of gout are reviewed by Gudzent and Holzmann. Sclerotic changes in the heart, arteries or kidneys predominated. They attribute these changes to poisons that are a cause of the gout itself.

Zentralblatt für Chirurgie, Leipzig

54: 1345-1408 (May 28) 1927

Heterotopic Epithelial Proliferations Having the Structure of the Uterine Mucosa. M. Dietlein.—p. 1346.
Stereoscopic Myelography. M. Borchardt.—p. 1353.
Constitution as Cause of Secondary Hemorrhages After Gastro-Enterostomy. M. Krabbel.—p. 1354.
Suture of the Anterior Crucial Ligament. E. Haussecker.—p. 1355.
Early Operation in Acute Necrosis of the Pancreas. L. Fiedler.—p. 1356.
*Ganglions of the Semilunar Cartilages of the Knee. R. Majer.—p. 1358.
Treatment of Fracture of the Radius. J. Becker.—p. 1360.
"Posttonsillitic Sepsis or Bacteriemia. L. Drüner.—p. 1363.
*Perforation Peritonitis or Diabetes? W. Usadel.—p. 1364.

Ganglions of the Semilunar Cartilages of the Knee.—In Majer's series, consisting of six ganglions of the external and three of the internal semilunar cartilage, appear two cases in which ganglions were present in both knees. These, he believes are the first bilateral cases reported. In one of these, the patient could not recall an injury.

Symptoms Simulating Perforation Peritonitis in a Diabetic Patient.—A young man was seized with violent pains in the region of the stomach. When seen by Usadel, after twelve hours, the abdomen was distended and tense, particularly in the upper part, the pulse was soft and rapid, the temperature 37 C. The urine contained sugar and acetone in large amounts. Insulin was given and the abdomen opened, but no sign of the anticipated perforated ulcer was found. The abdomen was closed and the patient recovered. Usadel urges that examination of the urine for sugar should never be neglected when there are symptoms of perforation peritonitis, and that, if sugar is found, the question of a diabetic origin of the symptoms should be given consideration.

54: 1409-1472 (June 4) 1927

Circumscribed Cavernous Hemangioma of Capsule of Knee Joint. H. Eggers.—p. 1409.
Treatment of Habitual Dislocation of Shoulder. E. Heymann.—p. 1411.
Treatment of Acute Perforation of Peptic Ulcer. B. von Tessényi.—p. 1414.

54: 1473-1536 (June 11) 1927

*Colon Bacillus Antiserum. M. Katzenstein.—p. 1474.
Idem. H. Schmidt.—p. 1477.
Alcohol Injections in Brain Cortex in Athetosis. N. N. Nasaroff.—p. 1478.
*Results of Radical Operation of Carcinoma of Bile Ducts. E. Fulde.—p. 1481.
Regeneration of Extensor Tendons Without Sheaths. A. Grebe.—p. 1487.
*Emphysema of Skin After Perforation of Peptic Ulcer. S. Korach.—p. 1489.
Roffo's Reaction for Carcinoma. H. Hilarowicz and W. Jankowska-Hilarowicz.—p. 1494.
Excision of Degenerated Accessory Liver. W. Krause.—p. 1498.
New Ureteral Cystoscope. H. Haebler.—p. 1501.
Peptic Jejunal Ulcer and "Palliative" Resection of Stomach. E. Kreuter.—p. 1504.

Colon Bacillus Antiserum.—A favorable influence from the use of colon bacillus antiserum in a small series of cases of colon bacillus peritonitis is reported by Katzenstein. One cubic centimeter of serum is injected subcutaneously before operation to prevent anaphylaxis. If the pus has the colon bacillus odor, 25 cc. of the serum is injected intravenously and 75 cc. intramuscularly immediately after the operation.

Results of Radical Operation for Carcinoma of Bile Ducts.—One case of carcinoma of Vater's papilla, with cure of two years' standing after transduodenal extirpation, is reported by Fulde. He analyzes the literature of carcinoma of the different bile ducts. The immediate operative results are far better with the radical than with palliative operations.

Emphysema of Skin After Perforation of Gastric Ulcer.—Korach describes a case in which emphysema of the skin of the umbilical region appeared two or three hours after perforation of an ulcer of the stomach. On examination one-half hour after death and eleven hours after onset of symptoms, the emphysema had extended over the entire body, from the eyelids to the soles of the feet; it was particularly great over the abdomen. When the peritoneal cavity was opened, a large quantity of gas escaped with a hissing noise; on application of a lighted match, the gas burned with a nonluminous, blue flame, the characteristics of a hydrogen flame. The same occurred when the skin of various parts of the body was pricked and pressure applied.

Zentralblatt für Gynäkologie, Leipzig

51: 1417-1480 (June 4) 1927

*Hormonal Sterilization of Female Animals. L. Haberlandt.—p. 1418.
*Effect of Occupation on Bony Pelvis. M. Hirsch.—p. 1420.
Tuberculosis of Spine and Pregnancy. E. König and E. Poeck.—p. 1427.
Cesarean Section in Placenta Praevia. O. Korthauer.—p. 1434.
*Diathermy and Menstruation. I. von Büben.—p. 1440.
Retention of Membranes. H. Nölle.—p. 1445.
*Treatment of Eclampsia. Rodenacker.—p. 1446.
Multiple Idiopathic Pigmented ("Hemorrhagic") Sarcoma of Vulva. A. Garbień.—p. 1450.
Vogel's Pregnancy Reactions. I. Jakowleff.—p. 1455.

Hormonal Sterilization of Female Animals.—Temporarily sterilization of rabbits was produced by Haberlandt by subcutaneous implantation of the ovaries of pregnant rabbits and guinea-pigs, and by injections of a preparation of the ovary or placenta; the same results were obtained in white mice by feeding ovarian and placental extracts. The treatment did not injure the animals and subsequent offspring were normal. The effect appears to be due to a hormone inhibiting ovulation. Ripe follicles were not seen after the treatment.

Effect of Occupation on Formation of Pelvis.—The figures presented by Hirsch show the deleterious influence on the form of the female pelvis of certain kinds of work during late childhood and adolescence. Work requiring standing and excessive and disproportionate use of the pelvic and abdominal muscles is especially bad. The worst effects were seen in the mining and metal industries. Agricultural work appears to do the least harm, but even here contracted pelvis and pathologic labors were half again as frequent as among women who did not do any physical work. The danger diminishes steadily with the age at which the girl starts work. The textile industry has been the special field of Hirsch's investigations and he gives details concerning the muscular demands of this work and its effect on the immature bony pelvis. He urges that factory work should be prohibited to young girls.

Diathermy and Menstruation.—In Büben's experience, diathermy treatment is contra-indicated during menstruation and for a day or two before and after the period. In endometritis and myomas there is danger of aggravating the symptoms. In dysmenorrhea on a basis of genital hypoplasia, good results may be obtained from diathermy treatment given during the intermenstruum. He gave treatments three times a week, at a temperature of from 41 to 45 C., each lasting from twenty to thirty minutes. Three or four series of ten treatments each were usually necessary. An abdominovaginal or dorsovaginal application was used. Of fifty-two patients treated, 34.6 per cent were cured, 44.3 improved, 21.1 not improved.

Theory and Treatment of Eclampsia.—Eclampsia, in Rodenacker's view, is the result of disturbance of oxidation. Toward the end of pregnancy the oxidizing power of the tissues falls, and in eclampsia it sinks far below the level physiologic for pregnancy. Eclampsia is internal suffocation. He recommends insulin as a preventive, when oxidation is shown to be disturbed, since it has proved useful in oxydase poisoning. Since the power of oxidation rises rapidly in the puerperium, it is evident that the eclamptic woman should be delivered as speedily as possible.

Zentralblatt für innere Medizin, Leipzig

48: 657-672 (July 2) 1927

*Hypnosis and Thermoregulation. Gessler and Hansen.—p. 658.
*Serum Calcium in Deforming Arthritis. R. E. Mark.—p. 660.

48: 673-704 (July 9) 1927

Survey of Pharmacology. C. Bachem.—p. 673.

48: 705-728 (July 16) 1927

Survey of Pharmacology. C. Bachem.—p. 705. C'cn.

Hypnosis and Thermoregulation.—Gessler and Hansen hypnotized healthy subjects. When such persons were stripped and exposed to chilly air, the respiratory metabolism increased less than in normal subjects. Increase did not occur, if the suggestion of a feeling of being warm was given. A suggestion of cold given to a hypnotized subject in a warm room increased the metabolism considerably.

Serum Calcium in Deforming Arthritis.—In addition to his former three cases, Mark found hypercalcemia (from 14.3 mg. to 20.31 mg. per hundred cubic centimeters) in four patients with deforming arthritis. The serum calcium was normal in patients with acute and chronic rheumatic polyarthritis.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

71: 2975-3066 (May 28) 1927

Morbid Appetite in Pregnancy. G. H. Mulder.—p. 2976.
"Cristals" in the Eye. E. Marx.—p. 2979.
*Agranulocytosis. H. Vos and T. A. Staal.—p. 2983.

Agranulocytosis.—A case of agranulocytosis in a man, aged 30, is reported by Vos and Staal. The patient entered the clinic complaining of sore throat and extreme weakness. The rectal temperature was 40.5 C. Throat and general symptoms had been present for three weeks. The blood picture showed 2,500,000 erythrocytes and 3,000 leukocytes; myelocytes and polymorphonuclear leukocytes were not present. He died two days later. The blood picture then showed only 1,400 leukocytes, composed of small lymphocytes, 92.5 per cent; large lymphocytes, 3.5 per cent; myelocytes, 1.5 per cent; polymorphonuclear leukocytes, 2.5 per cent. At necropsy the bone marrow was found to contain few cells. Myeloblasts predominated. Myelocytes were very scarce. Mitoses were rare. The number of megakaryocytes was normal. Lymphocytes were scattered thinly through the marrow. These changes in the bone marrow are not seen in any other disease than agranulocytosis, which consists essentially of a lesion involving exclusively the leukopoietic function of the bone marrow. The gangrene and sepsis are secondary and the rôle of the tonsils is without importance in the etiology.

Acta Chirurgica Scandinavica, Stockholm

61: 385-586 (May 25) 1927

Pathology and Treatment of Toxic Goiter. J. Holst.—p. 385.
Circulatory Conditions in Arterial Embolism of Lower Extremities. E. Perman.—p. 443. In English.
*Acidity in Stomach After Gastro-Enterostomy and Resection. E. Perman.—p. 465. In English.
*Postoperative, So-Called Paralytic Ileus. H. Olivecrona.—p. 485. In English.

Case of Chronic Thyroiditis. E. Perman and F. Wahlgren.—p. 535. In English.
Metatarsus Latus and Hallux Valgus. N. Silfverskiöld.—p. 543.
Case of Esophageal Peptic Ulcer. S. Norlén.—p. 561. In English.
Cavernoma Ilei Simulating Intussusception. E. Michaëlsson.—p. 570. In English.
Case of Dislocation of Knee. E. Michaëlsson.—p. 575. In English.
Embolism of Superior Mesenteric Artery. S. Sjövall.—p. 577.

Acidity of Stomach After Gastro-Enterostomy and Resection.—In Rissler's clinic, Perman writes, gastric fistula is established in all cases of gastro-enterostomy. It lessens the risk of leakage at the suture. Fluids may be taken by mouth and nausea and vomiting are avoided. The gastric acidity was determined in a number of patients thus treated. In thirteen cases, high values were found immediately following the operation, in several cases being higher than in patients without gastro-enterostomy. In five patients in whom the entire pyloric portion had been resected, the production of hydrochloric acid was efficient. In two, in whom a large part of the corpus had also been resected, the acidity was greatly reduced. Physiologic sodium chloride solution must be administered to compensate for the loss of hydrochloric acid through the fistula.

Postoperative, So-Called Paralytic Ileus.—From clinical and experimental observations, Olivecrona concludes that neither trauma nor peritonitis cause any paresis of the muscles of the intestinal wall. An explanation of the well marked and relatively prolonged cessation of peristaltic action produced by trauma is probably to be found in some inhibitory reflex via nerve tracts through the solar plexus, either in the form of an axon reflex or a true reflex. Inhibition via intramural tracts or tracts that pass in the immediate vicinity of the intestinal wall is probably responsible for the cessation of peristalsis which often (though not constantly) follows perforation peritonitis.

Acta Obstet. et Gynec. Scandinavica, Helsingfors

6: 1-108, 1927

*Contractile Myoma. U. Mäkinen.—p. 1.
Acute Intestinal Occlusion After Gjilliam's Operation. E. Petersen.—p. 13.
Injury to Female Genital Organs sub Coitu. I. Rahm.—p. 28.
*Sex Ratio in New-Born Infants. P. Wetterdal.—p. 59.
*Functional Cardiac Diseases and Essential Cardiac Hypertrophy in Normal Pregnant Women. F. G. Jensen and Norgaard.—p. 67.

Contractile Myoma.—A uterine myoma which contracted under the influence of intravenous injection of a pituitary extract and of intramuscular injection of a preparation of ergot was observed by Mäkinen in a woman during the puerperium. The tumor, an intraligamentous growth, was excised and microscopic study showed an unusual arrangement of the muscle fibers. They ran parallel to the surface, in large, uninterrupted bundles. The muscle "bridges" were formed of these bundles, which in their own course followed the direction of the bridge. The muscle fibers were thicker and longer than is usual and the nuclei were remarkably large. The contractility of the tumor may be explained partly by the reduction of the edema associated with the pregnancy, by the uniform arrangement of the muscle tissues and by the length of the muscle fibers. The muscle "bridges" were probably the most important factor, since it is possible that the detached part of the uterine wall penetrating the myoma represents the muscular layer of the uterus.

Sex Ratio in New-Born Infants.—Wetterdal studied the number of male births as compared with that of female births in premature deliveries. The relative number of male births fell almost continually from the thirty-second to the forty-sixth week of pregnancy. He did not find that the relative number of male births was greater in primiparae than in multiparae.

Functional Cardiac Diseases in Pregnancy.—Jensen and Norgaard followed the course of pregnancy in 239 women. In thirty-nine, manifestations of heart disease appeared in the second half of pregnancy. The symptoms increased until birth was accomplished and disappeared early in the puerperium. They were not relieved by digitalis. Both hypertrophy and dilatation of the heart were demonstrated, but do not alone explain the symptoms. A relative insufficiency of the tricuspid valve, combined with a change in the blood supply, is probably the main factor in the functional heart diseases of pregnancy.

Hospitalstidende, Copenhagen

70: 507-524 (June 2) 1927

*Sigma Reaction and Wassermann Reaction in Blood and Spinal Fluid in Paralytics. J. C. Smith.—p. 507.

Sigma Reaction and Wassermann Reaction in Blood and Spinal Fluid of Paralytics.—Examining his cases of dementia paralytica Smith found that the sigma reaction in the blood was negative in only three out of sixty-four instances, in two of these the Wassermann reaction was also lacking; the Wassermann reaction was negative in three cases, one of which presented a positive sigma reaction. In the spinal fluid tests the sigma reaction was negative in five out of sixty-three cases, the Wassermann reaction in five out of 129.

70: 525-548 (June 9) 1927

*Infantilism with Tetany, Epilepsy, Polyneuritis, Ichthyosis and Anemia of Pernicious Type. E. Rud.—p. 525.

Infantilism with Tetany, Epilepsy, Polyneuritis, Ichthyosis and Anemia of Pernicious Type.—Rud describes a case of pluriglandular disease in a man, aged 22, with apparent disturbances of the hypophysis, thyroid, parathyroids, testes, and probably also of the pancreas and suprarenals. At the same time epilepsy, tetany, polyneuritis, ichthyosis and anemia of pernicious type developed, all of which may, he thinks, bear a relation to the disturbances in internal secretion.

Hygiea, Stockholm

89: 433-464 (June 15) 1927

Compensation for Tuberculosis Contracted in Military Service. A. Gullbring.—p. 436.

89: 465-496 (June 30) 1927

*Laparotomy for Myoma. L. Lindquist.—p. 468.

Laparotomy for Myoma.—Linquist summarizes the results in his 484 cases (221 previously reported). The immediate result in the 221 earlier cases was recovery in 219 cases and death (embolism) in two; in the 263 later cases, recovery ensued in all. The total primary mortality was 0.4 per cent. The most frequent complication was thrombosis, with consequent pulmonary embolism in some cases. Combination with malignant tumors occurred thirty times (11.4 per cent) in the second series; it occurred in 8.6 per cent of the total number of cases. Late results show 174 recoveries (94 per cent) in series II, and 338 recoveries (90 per cent) in the total 484 cases. He advocates operative treatment, if possible, and prefers supravaginal amputation unless total extirpation is specially indicated.

Norsk Magazin for Lægevidenskapen, Oslo

Supplement (July) 1927

*Action of Alcohol on Color Perception. K. Zeiner-Henriksen.—pp. 1-120.

Action of Alcohol and Certain Other Poisons on Color Perception.—In general, Zeiner-Henriksen, states, alcohol, even in quantities not sufficient to intoxicate, reduced the power to distinguish differences in color. Practically, this effect may be of great importance when it concerns the use of colored signals. Studies with cocaine, strychnine and other substances revealed that nerve elements which discern colors react differently to different poisons.

Ugeskrift for Læger, Copenhagen

89: 569-586 (June 30) 1927

*Serum Sickness. H. Heckscher.—p. 569. C'td.
Maclean's Renal Function Test. E. Gottlieb.—p. 573.
Two Cases of Diphtheria Treated with Manganese. C. G. Budde-Lund.—p. 575.

Serum Sickness.—Heckscher's review is based on the literature and on his observations in diphtheria. He describes two cases in men, aged, respectively, 28 and 30, with acute reactions immediately after intravenous injection of the serum. Serum sickness, he says, is usually characterized by onset of the symptoms some time after injection of the serum. The cause of the changes in the organism in serum sickness is not yet clear.